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HIV RISK BEHAVIOR AND BELIEFS OF HIV-SEROPOSITIVE DRUG USERS

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To assess HIV risk behavior, beliefs, attitudes and intentions among HIV-seropositive drug users (DUs), we studied 122 HIV-positive DUs (including ninety-five current injectors) participating in a longitudinal HIV-study among DUs in Amsterdam. All were familiar with their serostatus. Over a period of four months, 20% of the sample put others at risk of HIV infection, mainly through unsafe sex. Forty-nine percent think they might infect someone with HIV in the future, again mainly through unsafe sex. Although the majority intends to use condoms, self-efficacy and response efficacy is low; that is, many do not think they are able to use condoms when necessary and many have limited confidence in the efficacy of condoms in preventing HIV transmission. Correlates of HIV risk behavior were non-Dutch nationality and being a female prostitute. The results suggest that, next to efforts which aim to prevent new infections among HIV-negative injectors or sexual partners of injectors, prevention efforts should focus on HIV-seropositive DUs or former DUs.

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Introduction

Sharing of needles and syringes is the main route of transmission of human immunodeficiency virus (HIV) among drug injectors (Friedland et al. 1985), while heterosexual transmission is the main route from injectors to noninjectors (Des Jarlais, Friedman and Hopkins 1985; Moss 1987). Behavioral change is dependent on knowledge, availability of means, and motivation to change. Studies among Amsterdam drug users (DUs) (Korf et al. 1988; Hartgers et al. 1991) suggest that Amsterdam DUs are well aware of HIV transmission paths. Furthermore, Amsterdam has a large needle- and syringe exchange program (Hartgers 1989) and condoms are easily available. In relation to injecting drug use, many European and U.S. efforts to prevent new human immunodeficiency virus (HIV) infections focus on sexual and injecting risk behavior of persons who are not infected (both injectors and sexual partners of injectors). Behavioral changes among these HIV-negatives are — given that knowledge and means are present — dependent on a desire for self-protection against HIV infection. However, in order to prevent new HIV infections, it seems equally important to focus prevention programs at the — smaller — group of HIV seropositive (HIV+) DUs. One reason for safe behavior among HIV+ DUs might be the belief that AIDS can be postponed by avoiding reinfection or other infections. However, to our knowledge, no evidence for this belief has been reported. Next to this desire for self protection, safe behavior of HIV-positive drug users depends on the wish to protect their injecting and/or sexual partners from acquiring HIV, which could be termed a wish for "other-protection."

Provided that knowledge and means are present, models of health behavior tend to focus on motivation for self-protection. However, some of the concepts employed in these models may be relevant for other protective behavior, for example, the perceived self-efficacy with regard to a certain behavior (i.e., the conviction that one is able to perform a certain behavior consistently) (Bandura 1977, 1987), the perceived efficacy of the advocated ("safe") response in reducing HIV-risk (response efficacy) (Rogers 1983), the attitude toward the behavior (Fishbein and Ajzen 1975) and the intention to perform safe behavior (Fishbein and Middlestadt 1989). This article presents the results of a study among HIV+ DUs who are aware of their serostatus. Central to the aims of the study were the extent to which these drug users put others at risk of HIV infection, their perceptions of the risk of transmitting HIV, their intentions with regard to future behavior, and the characteristics of HIV+ DUs who put others at risk.

Methods

We studied HIV+ DUs who participated between June and November 1990 in a longitudinal HIV study among DUs in Amsterdam. This ongoing cohort study (Van den Hoek et al. 1988, 1989a; Van Haastrecht et al. 1991) includes voluntary and confidential HIV testing and counselling, combined with a standardized interview conducted by trained professionals. Participants can either participate

once or take part in the follow up study (in which study visits are scheduled every four months). Enzyme linked immunosorbent assays (ELISA'S) are used for HIV testing. Confirmation of a positive specimen is performed by competitive ELISA's and/or by immunoblotting, as previously described (Van den Hoek et al. 1988).

All HIV+ DU's who were familiar with their serostatus and who came for a follow up visit in the above mentioned period were given an additional questionnaire (see Table 1) besides the standardized interview on medical history, demographic factors, drug use and sexual history. This resulted in a sample of 122 HIV+ DU's, who came for a second to sixteenth visit in the cohort study, and who reported "current" behavior, that is, behavior in the period since the preceding interview (median 4.2 months, range 3.3–12.6).

Univariate statistics include the Chi-square test of independence, Fisher's exact test and the Mann Whitney test (M-W) and Kruskal-Wallis test (K-W) for two or more independent samples (employing scales as described in Tables 2 and 3). Predictors of unsafe sex were estimated by stepwise logistic regression modeling.

Results

Demographics, Current Sexual and Injecting Risk Behavior

The sample consists of 61% male and 66% Dutch DUs. Their mean age in years is 32.6 (SD 5.5), and they have lived a mean number of 16.7 years in Amsterdam (SD 11.8). Having steady housing is reported by 93%; currently working as a prostitute is reported by 15% (only females, hereafter indicated as female prostitutes). Almost all (98%) report a history of injecting. They have used heroin regularly for a mean number of 10.0 years (SD 4.7); current daily methadone use is reported by 79%. Ninety-eight (80%) DUs in the sample are (at the time of their visit) classified in CDC II (asymptomatic HIV infection), eighteen (15%) in CDC III (generalized lymphadenopathy) and six (5%) in CDC-IV (three with symptomatic HIV disease, three with AIDS).

Sixty two of the 122 HIV+ DUs (51%) are heterosexually active; that is, they report having had vaginal sex with a steady sexual partner (N=43), with a casual partner (N=16) and/or with clients (N=18) in the previous months. Heterosexual activity is not significantly different between DUs in the different CDC subgroups. Six DUs (10% of the heterosexually active) report having had a sexually transmitted disease (STD) in the previous four months. Unsafe vaginal sex (defined as not [always] using condoms during vaginal sex in the preceding months) is reported by twenty nine HIV+ DUs (24%, 47% of the sexually active). When eight, who report only unsafe vaginal sex with an HIV+ steady partner, are excluded, this results in twenty one HIV+ DUs who could have transmitted HIV via their sexual practices (hereafter called sex risk group or SR-group — 34% of sexually active HIV+ DU's). The SR group consists of fourteen females and seven males. Thirteen HIV+ DU's (eight females, five males) report unsafe sex with a private steady

Table 1
Additional Questionnaire for HIV-Positive Drug Users

1. Estimated chance of acquiring syphilis in the future
   (1 item, 1-zero, 2-small, 3-moderate, 4-big to 5-very big)
2. Estimated chance of infecting someone with HIV through sex in the future
   (1 item, 1-zero to 5-very big)
3. Estimated chance of infecting someone with HIV through needle sharing in the future
   (1 item, 1-zero to 5-very big)
4. Response efficacy condoms
   (1 item: If someone always uses a condom at each sexual contact, how certain are you then that that person prevents infecting someone else with the AIDS virus through sex? 1-not at all certain, 2-not certain, 3-sometimes certain, sometimes not, 4-certain, 5-extremely certain)
5. Negative attitude toward condoms
   (2 items: annoying when having sex, 1-not at all annoying to 5-extremely annoying; feeling uncomfortable, 1-not at all uncomfortable to 5-extremely uncomfortable. The items-scores are summed, divided by 2 and truncated, so that a five-point scale results: 1-not annoying/uncomfortable to 5-extremely annoying/uncomfortable.)
6. Self-efficacy condom use, separately asked for prostitutes concerning sex with clients, and for heterosexually active nonprostitutes, concerning sex with casual partners
   (5 items, the first one "How easy or difficult would you find it in the next half year to always use a condom at each sexual contact with a client/casual partner," 1-very easy to 5-very difficult. The following 4 items represent specific difficult situations (for example the client wants to pay more, or the casual partner finds it bothersome), and are scored the same way. If the answer to the first question is 5-very difficult, the following 4 questions automatically get score 5. The item-scores are summed, inverted, divided by 5 and truncated, so that the final score range runs from 1-very low self efficacy to 5-very good self efficacy.)
7. Intention condom use, separately asked for prostitutes, concerning sex with clients, and for heterosexually active nonprostitutes, concerning sex with casual partners
   (1 item: How strong is your intention to always use a condom in the next half year if you have sexual contact in the vagina with clients/casual partners? 0-do not know, 0-not at all strong, 1-not so strong, 2-strong, 3-very strong)
8. Intention needle sharing
   (1 item: How strong is your intention in the next half year to let your used needle never be used by somebody else? See 7 for answering categories.)

partner, four (two females, two males) with a private casual partner, and four HIV+ DUs (all female prostitutes) with a client. The thirteen HIV+ DUs who had unsafe sex with a steady partner report that eight (62%) of these steady partners have never injected. Four (19%) of the twenty-one SR-DUs report having had a STD in the previous months, as compared to two (5%) among the other forty-one sexually active HIV+ DUs (Fisher exact test, $p = 0.09$).

Ninety-five HIV+ DUs (78%) are current injectors. Four (4%) of these report current needle sharing, defined as letting a needle and syringe, which they had already used themselves, be used by somebody else. These four persons do not report unsafe vaginal sex.

Risk Estimates, Beliefs, Attitude and Behavioral Intentions

With regard to the risk estimates, fifty-seven HIV+ DUs (47%) think they have a chance to get syphilis in the future (score $\geq$ 2), while fifty-four (44%) and twenty-five (21% — 26% of current injectors) think they might infect someone else with HIV in the future (score $\geq$ 2), respectively, through sex or through needle sharing (see Table 2 for frequencies). All in all, sixty HIV+ DUs (49%) think they might infect someone with HIV in the future, either through sex, through needle sharing or through both. The SR-group (N=21), when compared with the forty-one heterosexually active and the sixty not heterosexually active subjects, think more often they might infect someone with HIV through sex in the future (76%, 44% and 33% with score $\geq$ 2, respectively, K-W p=0.0005).

With regard to response efficacy, fifty-eight persons (48%) are uncertain (scores $\leq$ 3) about the efficacy of using condoms (the advocated response to avert the risk of HIV transmission) in preventing HIV transmission (Table 2). The SR-group, when compared with the other heterosexually active and the not heterosexually active subjects, are least uncertain about condom efficacy (33%, 46% and 53% with score $\leq$ 3, respectively; K-W, p=0.02). A negative attitude toward condoms (score $\geq$ 4) is reported by thirty-eight persons (31%) (Table 2). The SR-group, when compared with the other two groups, does not have a significantly more negative attitude (38%, 20% and 37% with score $\geq$ 4, respectively; K-W, p=0.08). When only the first two groups are compared (the SR-group and the other heterosexually active), there is also no significant difference (M-W, p=0.48).

Table 3 shows that sixteen (94%) of the seventeen female prostitutes in the sample who answered these questions have a strong or very strong intention to always use condoms with clients, but a high self-efficacy score ($\geq$ 4) with regard to condom use with clients is obtained by only seven (41%). SR-prostitutes have a less strong intention to use condoms with clients than the other prostitutes (M-W, p=0.03), but there is no significant difference with regard to self-efficacy.

There were 56 HIV+ DUs with current private partners (i.e., who report a steady and/or casual heterosexual partner[s] while not being a female prostitute), of whom forty-two answered the questions concerning intention and self-efficacy with

Table 2
Frequencies of Risk Estimates, Response Efficacy Condoms and Attitude with Regard to Condoms Among HIV+ DUs Aware of Their Serostatus (*N*=122, unless otherwise indicated)

N (%)[a]	Zero 1	Small 2	Moderate 3	Big 4	Very Big 5
Estimated Chance of Acquiring Syphilis in the Future	65 (53)	44 (36)	10 (8)	2 (2)	1 (1)
Estimated Chance of Infecting Someone Else with HIV Through Sex in the Future	68 (56)	39 (32)	5 (4)	7 (6)	3 (2)
Estimated Chance of Infecting Someone Else with HIV Through Needle Sharing in the Future (*N*=121)	96 (79)	15 (12)	3 (2)	3 (2)	4 (3)
	Not At All Certain 1	2	3	4	Extremely Certain 5
Response Efficacy Condoms	4 (3)	34 (28)	20 (16)	43 (35)	21 (17)
	Not At All Annoying/ uncomfortable 1	2	3	4	Extremely Annoying/ uncomfortable 5
Negative Attitude Condoms (*N*=121)	10 (8)	36 (30)	37 (31)	30 (25)	8 (7)

[a] Percentages have been calculated with the effective sample as denominator

regard to condom use with future casual partners. (Initially, the questionnaire was unclear at this point. Interviewers assumed at first that HIV+ DUs with a steady partner did not have to answer these questions, hence the 14 [56 minus 42] missing values.) Most (*N*=37, 88%) have a strong or very strong intention to use condoms with casual partners, but a high self-efficacy score was obtained for only twelve (29%) (Table 3). There were no significant differences between the SR-group and the other subjects with regard to intention and self-efficacy.

Finally, the subgroup of ninety-five current injectors were asked about their behavioral intentions about needle sharing; eighty-seven (93%) had a strong or very strong intention not to share. It is worth noting that all four needle sharers reported a very strong intention not to share.

Table 3
Frequencies of Behavioral Intention and of Self-efficacy Condom Use Among HIV+ DUs, Aware of their Serostatus

N (%)[a]	Do Not Know/ Not At All Strong 0	Not So Strong 1	Strong 2	Very Strong 3
Intention Condom Use with Clients (*N*=17 Prostitutes)	0	1 (6)	2 (12)	14 (82)
Intention Condom Use with Casual Partners (*N*=42 Heterosexually active DUs)	5 (12)	0	3 (7)	34 (81)
Intention Not to Share Needles (*N*=94 Current Injectors)	7 (7)	0	4 (4)	83 (88)

	Very Low Self-efficacy 1	2	3	4	Very Good Self-efficacy 5
Self-efficacy Condom Use with Clients (*N*=17 Prostitutes)	1 (6)	1 (6)	8 (47)	5 (29)	2 (12)
Self-efficacy Condom Use with Casual Partners (*N*=41 Heterosexually Active DUs)	10 (24)	4 (10)	15 (37)	9 (22)	3 (7)

[a] Percentages have been calculated with the stated effective sample as denominator

Correlates of Sexual Risk Behavior

Since unsafe sexual behavior was more prevalent than unsafe injecting behavior, we only examined demographic and drug use correlates of sex risk (SR) behavior. Four demographic variables were univariately related to SR behavior ($p < .05$): female gender, younger age, a non-Dutch nationality and being a female prostitute. No significant correlations with drug use variables (like current cocaine use, alcohol use or injecting) were found. Since all prostitutes in the present sample are female, a new variable (gender/prostitution) was made with three categories: males, female prostitutes and other females. In a logistic regression analysis, this variable and nationality were independent predictors of unsafe vaginal sex (with $p < 0.05$). No interaction was found. The model could not be improved by entering response efficacy or attitude. With both nationality and gender/prostitution in the model, persons of non-Dutch nationality have an increased risk (OR=3.14, CI=1.07 – 9.24) when compared to Dutch DUs. Female prostitutes, when compared to females, have an increased risk of having unsafe vaginal sex (OR=3.49, CI=0.92 – 13.30). Males, when compared to females, have a decreased risk (OR=0.65, CI=0.18 – 2.31). However, the finding that female prostitutes are a high-risk group does not mean that they have only unprotected contacts with clients. Four of the eight prostitutes in the SR-group had unsafe vaginal sex with clients, while the other four had safe sex with clients, but unsafe sex with private partners.

Discussion

With regard to current behavior, three-quarters of our sample of HIV+ DUs inject and half are heterosexually active. This confirms other findings that a substantial proportion of HIV-infected DUs are heterosexually active (Van den Hoek et al. 1990, 1992; Schrager et al. 1991).

Before discussing our findings, we would like to reiterate that the present sample consists exclusively of HIV+ DUs aware of their serostatus, and that the dependent variable is unsafe vaginal sex (i.e., the risk of HIV transmission could not be excluded). Most research of heterosexual behavior among DUs concerns DUs with unknown serostatus and concerns condom use in general, irrespective of the likelihood of transmission. A further complication is that some studies are restricted to 100% condom use during heterosexual contacts as outcome variable, while other employ any condom use as outcome variable. We have tried to take these differences into account in comparing the results. Because the data are self-reported, our findings may be biased due to memory loss or a tendency to give socially desirable answers. Another limitation of our study is that the sample consists of DUs volunteering for an HIV test combined with an epidemiological study of HIV. Therefore, one should be careful in generalizing the present findings to the larger population of HIV+ DUs.

The vast majority of the present sample of HIV+DUs have "good" intentions with regard to their behavior. Nevertheless, one-fifth knowingly put others at risk of HIV infection in the previous four months, the majority through sexual contact.

The rate of condom use among these HIV+ DUs is much higher than reported in surveys of DUs with unknown serostatus (Donoghoe et al. 1989; Paulussen et al. 1990; Magura et al. 1990; Klee et al. 1990; Saxon et al. 1991; Lewis and Watters, 1991). This is in line with findings that HIV+ IVDUs are more likely to use condoms than HIV-negative IVDUs (McCoy et al. 1990; Van den Hoek et al. 1990, 1992).

The proportion of DUs in the present sample who disclosed their HIVpositive status to their sexual and/or injecting partner is unknown. To our knowledge, there are no studies among DUs adressing this issue. In a study of sexually active HIV+ homosexual men, Marks and associates (1991) found a high prevalence of nondisclosure of HIV infection in combination with unsafe sex.

Although needle sharing is only reported by a minority of the present sample, this behavior is very effective in transmitting HIV. Unsafe vaginal sex was reported both with injecting and noninjecting partners. Among current IDUs, heterosexual transmission seems to play a minor role, as compared to transmission by injecting risk behavior (Des Jarlais et al. 1987; Chaisson et al. 1987; Schoenbaum et al. 1989; Battjes et al. 1990; Nelson et al. 1991; Van Ameijden et al. 1992). However, this does not imply that the risk of heterosexual transmission among current IDUs is zero. The considerable risk of heterosexual transmission from injectors to noninjectors, especially through male-to-female transmission, is well documented (France et al. 1988; Fordyce et al. 1991; Padian et al. 1991). Therefore, the prevalence of unsafe vaginal sex in the present sample gives cause for concern, especially since almost half of the sample acknowledge that they could possibly transmit HIV through unsafe sex in the future. Such an acknowledgement comes close to being a behavioral expectation, and it has been argued that a behavioral expectation is a better predictor of behavior than intention (Warshaw and Davis 1985; Sheppard et al. 1988).

About one-third of these HIV-positive DUs report a clearly negative attitude toward condoms. This compares favorably to IVDUs with unknown serostatus — with a low level of condom use — of whom 77% expressed a strong dislike for condoms (Jones and Vlahov 1989). Condom use among IVDUs with unknown serostatus has been found to be related to attitude toward condoms (Paulussen et al. 1990) and to a greater personal acceptance of condoms (Magura et al. 1990). In the present sample, no relation was found between unsafe vaginal sex and a negative attitude toward condoms.

The perceived self-efficacy with regard to condom use is low among the DUs in the present sample, which means that most of these HIV+ DUs do not feel confident about their ability to use condoms consistently, either with clients or with casual partners. Furthermore, response efficacy associated with condom use is low: half of these HIV+ DUs are not certain that condoms are an effective means to prevent HIV infection. Respondents most often referred to rupture or slipping off of condoms during intercourse.

Contrary to our expectations, the HIV+ DUs in the SR-group did not have lower levels of self- and response efficacy than the other HIV+ DUs. This appears to be similar to findings by Magura and associates (1990) and Huang and colleagues (1989), but differs from findings by Abdul-Quader and associates (1990). The first study fails to find an association between condom use and perceived condom efficacy against AIDS; the second finds that health beliefs play a relatively minor role in predicting condom use among IVDUs as compared to situational factors; the third finds health beliefs associated with self-reported sexual risk reduction. All three studies concern DUs with unknown serostatus.

In the present study, neither social cognitive characteristics nor drug use characteristics are associated with unsafe vaginal sex; the strongest indicators are "being a female prostitute" and "having a non-Dutch nationality." The first risk indicator is in line with Van den Hoek and colleagues (1989b), who found that sexually transmitted diseases are highly prevalent among addicted female prostitutes in Amsterdam, despite a (self-reported) high frequency of condom use. Both risk correlates indicate a marginal social position, which supports the view that social and cultural factors often interfere with adoption of preventive health behaviors (Levine and Sorenson, 1984; Mondanaro 1987; Mays and Cochran 1988; Worth 1989; Korf et al. 1990; Singer et al. 1990; Sibthorpe et al. 1991).

Although Schilling and associates (1991) find modest positive outcomes of an intervention aiming to improve condom use skills among ninety-one female methadone patients with unknown serostatus, the present findings suggest that the value of using persuasive methods and of skills training — to ameliorate attitude, response and self-efficacy — is yet uncertain among these Amsterdam HIV+ DUs. More detailed research seems necessary to investigate the underlying social and cultural processes that generate the observed relations and to develop an effective prevention approach. For example, Stone and colleagues (1989) recommend tailoring information to the group, aiming interventions at couples (IVDUs and partners) and at their peer groups, and stressing both self-protective and altruistic (i.e., other-protective) themes.

In general, it seems potentially worthwhile to focus prevention efforts at injecting and sexual HIV risk behavior of HIV+ drug users, especially since more and more DUs learn their serostatus after HIV testing. Since the potential behavioral outcome of not using condoms is quite different for HIV-positives, HIV-negatives and persons unaware of their serostatus, the determinants of not using condoms are likely to differ between these groups (see Fishbein and Middlestadt 1989). However, in many of the above cited studies of condom use by IVDUs, no information is provided on serostatus nor on knowledge of serostatus, which makes it difficult to understand and interpret the results. For these reasons, it seems important to take serostatus and knowledge of serostatus into account in studying condom use among IVDUs and their partners and in developing effective intervention strategies with regard to condom use.

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