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## Sexual behaviour of heterosexual individuals with HIV infection naive for antiretroviral therapy in Italy

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*Further data are available  
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**Background:** Specific information about determinants of sexual behaviour of HIV infected heterosexuals, like injecting drug use (IDU), are essential to design interventions aimed at promoting safer sex practices.

**Methods:** We analysed data on sexual behaviour collected, between March 1997 and March 1999, through a self administered questionnaire among 1050 IDUs and 642 non-IDU heterosexuals enrolled in a prospective multicentre cohort study on the natural history of HIV infection.

**Results:** Among non-IDU heterosexuals, more women (48.5%) than men (25.1%) ( $p < 0.001$ ) reported that they were infected by HIV positive regular partners whose HIV status they were not aware of. Among the 1119 heterosexual males, one fifth reported having had more than 25 sexual partners during their lifetime. Condom use in the last sexual intercourse was more common among heterosexual IDUs (64.9%) than among non-IDU heterosexual males (58.3%) ( $p = 0.05$ ). Heterosexual IDU males were more likely (66.7%) than non-IDU heterosexuals (50.6%) to have an HIV negative partner ( $p < 0.001$ ). Of the 573 heterosexual females studied, 10.2% reported having had more than 25 lifetime sex partners. This proportion was higher among heterosexual IDUs (18.8%) than among non-IDU heterosexuals (4.3%) ( $p < 0.001$ ). Nearly 50% of the women in both groups reported having used a condom in the last intercourse. Almost 57% of heterosexual IDUs had a current HIV negative partner, compared with 34.9% non-IDU heterosexuals ( $p < 0.001$ ). In both sexes, the findings from univariate analysis were confirmed by multiple logistic regression analysis.

**Conclusions:** This study identified some important differences, in both males and females, in sexual lifestyles according to injecting drug use (for example, in terms of HIV negative partners). This observation indicates the need to tailor HIV prevention messages according to history of injecting drug use.

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Keywords: sexual behaviour; injecting drug use; heterosexuals; HIV infection

### Introduction

In the absence of effective vaccines, the prevention of HIV spread at the population level continues to depend on interventions directed at both non-infected and infected people. These interventions ideally build on knowledge about current patterns of risk behaviour in the population groups of interest.

To date, for example, many prevention programmes have been directed at HIV seronegative people thought to be at high risk of exposure to HIV. Thus, many programmes have been aimed at promoting safer sex practices among homosexual men, and at reducing needle and syringe sharing by injecting drug users (IDUs), and have built on what is known about specific risk behaviours in these groups.<sup>1</sup>

Relatively little attention has been paid to the behaviour of people living with HIV.<sup>2</sup> Yet improved efficacy of therapies for HIV related problems has meant that more people are successfully living with HIV, and a growing proportion of people with HIV are aware of their infection status.<sup>3,4</sup> Interventions aimed at

helping them to adopt and maintain behaviours that do not pose risks for other people and/or for themselves continue to be called for, especially at a time of highly active antiretroviral therapy (HAART) when some people may be tempted to believe that improved treatment for HIV/AIDS means they can reduce their efforts to maintain safer sex practices.<sup>5</sup>

In Europe, heterosexually acquired HIV/AIDS remains a problem. Between 1992 and 1998, for example, increases from 10.0% to 15.3% in men and from 34.4% to 43.2% in women were reported by the European Centre for the Epidemiological Monitoring of AIDS.<sup>6</sup> In this context, and taking into account the growing access to antiretroviral therapy it is clear that more needs to be known about the sexual behaviour of heterosexual people with HIV/AIDS.

The number of studies on the sexual behaviour of heterosexual people with HIV nevertheless remains low. What studies there have been suggest that most people remain sexually active after knowing about their infection. The consistency of the findings on risky sexual behaviour is very variable,<sup>4</sup> however, and

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some studies point to other confounding variables such as the role of drug injecting behaviour<sup>7</sup> that have not been addressed/controlled for by all studies.

This report concerns a behavioural study undertaken on a large sample of people who enrolled in a cohort study of the natural history of HIV disease in the HAART era. The cohort study provided an opportunity to assess if and to what extent awareness about, and access to, combination antiretroviral treatment affects patterns of sexual behaviour. The overall aim of the study was to assess and describe sexual and drug using lifestyles in a cohort of patients who were recruited in infectious disease clinics in different parts of Italy, and who were "naive" for antiretroviral therapy at the time they enrolled in the study. In this paper, we describe baseline data regarding sexual behaviour of heterosexual people, according to sex and drug use history.

### Methods

This study was part of a larger multicentre, longitudinal observational study of the natural history of HIV infection, "The Italian Cohort Naive Antiretrovirals-ICONA", that was conducted across 67 hospital infectious diseases units throughout Italy.<sup>8</sup> Between March 1997 and March 1999, 3850 people with HIV/AIDS (PWH/A), volunteered and were enrolled in ICONA. They were aged 18 years or older, were at different stages of HIV disease, and before enrolment, had never received antiretroviral therapy (that is, they were "naive" patients). The study protocol and the informed consent form were approved by the human subject protection committees of the participating centres. After written informed consent was obtained from study subjects, information was elicited using a standard interview schedule administered by a physician at the unit. Baseline information included socio-demographic characteristics such as age, sex, education, occupation; information was also sought on how HIV infection had been acquired. Clinical and therapeutic data were abstracted from the clinical charts.

Among 67 ICONA centres 57 agreed to participate in this study. In these centres, HIV infected individuals were offered, at enrolment, a self administered, precoded questionnaire which covered: (1) sociodemographic characteristics; (2) health profile, including HIV screening history; (3) personal behaviour history, including sexual and drug using practices; (4) health perception, including description and self evaluation of personal health; (5) HIV risk perception; (6) sources of information on HIV/AIDS and psychological and social support; (7) knowledge about AIDS and antiretroviral therapies; (8) impact of HIV testing on social relations; and (9) quality of life.

For the purpose of this part of the study a number of personal characteristics were selected from the ones listed above. Particular emphasis was placed on sexual behaviour (including type and number of sexual partners,

frequency of sexual intercourse, and condom use) and awareness of partner's HIV status.

HIV infected individuals who completed the self administered questionnaire were included in this analysis if they reported having had sex exclusively with partners of the opposite sex. They were then classified according to whether they reported a history of injecting drug use (IDU). People who acquired HIV infection through IDU and heterosexual intercourse account for approximately 80% of AIDS cases in Italy, and they represent a major target for the prevention and control of HIV infection in the country. Whether use of injecting drugs is associated with different sexual lifestyles needs to be better clarified, and thus we investigate such issue among heterosexual IDU and non-IDU heterosexuals. Very few individuals reported same sex sexual relations and use of injecting drugs: accordingly, they were excluded from this analysis. Thus, since sexual lifestyles differ greatly between heterosexuals and non-heterosexuals, this study focused only on individuals who did not report same sex sexual relations.

At univariate analysis, tests of statistical significance included  $\chi^2$  test, and/or  $\chi^2$  test for trend when appropriate.<sup>9</sup> The difference in sexual life styles of IDU compared with non-IDU heterosexuals was further assessed by means of multiple logistic regression (MLR) analysis using the SPSS version 10.0 for Windows. MLR odds ratios (OR), and their 95% confidence intervals (CI), were estimated, separately in men and women, according to a model that included all the variables under evaluation plus age, education, and occupation. The stepwise backward procedure was used to identify the best fitting model.<sup>10</sup>

### Results

The self administered questionnaire on personal behaviour was completed by 2491 individuals of the 3439 (72.4%) who enrolled in the 57 participating centres. No significant differences were found in the age, sex, clinical stage of HIV infection, and mode of HIV acquisition of people who responded and those who did not. The present analysis is composed of a population of 1692 IDU and non-IDU heterosexuals.

The general characteristics of the 1050 IDU and the 642 non-IDU heterosexual individuals with HIV infection, naive for antiretroviral therapies, included in this analysis are listed in table w1 on the STI website. The group was primarily male (66.1%) aged between 30 and 39 years (65.3%). Approximately 80% of them enrolled in the first year of the study (1997), and almost 90% of them were living in northern (60.9%) or central (27.4%) Italy. Almost half (46.0%) were manual labourers and 28% were white collar workers.

At the time of enrolment into the study, 43.2% of the 1692 HIV infected individuals had never been proposed for antiretroviral therapy. Of the remainder, 16.7% refused antiretroviral therapies, and in about 30% a therapeutic regimen was not yet initiated because of time constraints. The proportion of

patients who refused to be treated ranged from 13.6% among asymptomatics at time of enrolment to 26.8% among the 157 patients with AIDS ( $p < 0.001$ ) (data not shown).

Among non-IDU heterosexuals, 48.5% of the women and 25.1% of the men said they had been infected through sexual intercourse with steady partners whose HIV serostatus they were not aware of ( $p < 0.001$ ) (data not shown). More men (57.6%) than women (14.8%) reported that they had been infected by casual partners ( $p < 0.001$ ) (data not shown).

In all, 1322 people (78.1%) reported being sexually active after they became aware that they were infected with HIV. Some selected indicators of sexual life styles are described thereafter, according to sex.

Among the 816 IDU and the 303 non-IDU heterosexual males included in this study, about one fifth reported having had more than 25 female sex partners during their life; about one tenth said they had had sexual intercourse five or more times in the 2 weeks before the interview. The proportion of lifetime sexual partners was similar in both IDU and non-IDU heterosexuals. More IDU males (81.9%) than non-IDU heterosexual males (66.3%) reported that they were sexually active after testing HIV positive. IDUs also reported a statistically significant higher frequency of sexual intercourse than non-IDU heterosexual males. Almost two thirds (63.2%) of the 1119 males said they had used a condom during the last intercourse. The proportion using condoms was higher among IDU (64.9%) than among non-IDU heterosexual (58.3%) males ( $p = 0.05$ ). Among males who had a sexual partner tested for HIV at time of interview, more heterosexual IDUs (66.7%) than non-IDUs (50.6%) said they had an HIV negative partner ( $p < 0.001$ ). Approximately one third of non-IDU heterosexual males said they ever had a female sexual partner who injected drugs; among IDU heterosexual males the proportion was three quarters ( $p < 0.001$ ).

The 234 IDU heterosexual and the 339 non-IDU heterosexual females with HIV infection included in this analysis appeared to have fewer partners than males. Slightly over 10% of women said they had more than 25 sex partners in their lifetime. There was a significant difference according to drug injecting history in the number of lifetime partners. IDU females were also more likely to report sexual activity after testing HIV positive than non-IDU females. No differences were noted between IDU heterosexuals and non-IDU heterosexual females in terms of number of sexual intercourse events in the 2 weeks preceding the questionnaire, or in terms of condom use at the last intercourse.

Just as in the case of males, more heterosexual female IDUs (56.9%) than non-IDUs (34.9%) who had a sexual partner tested for HIV at the time of the interview reported having an HIV negative partner ( $p < 0.001$ ). Almost all IDU heterosexual females (96.1%) said they had "ever had" a male sexual partner who injected drugs; among non-IDU heterosexuals

the proportion was 49.0% ( $p < 0.001$ ). Non-IDU heterosexual females were also significantly more likely than non-IDU heterosexual males to have "ever had" a partner who injected drugs (49.0% *v* 29.5%,  $p = 0.01$ ) and were less likely to currently have a HIV negative partner (34.9% *v* 50.6%,  $p = 0.003$ ).

Among males, the differences in sexual lifestyles between IDU and non-IDU heterosexuals noted at univariate analysis were confirmed by MLR. Particularly, IDU males had a higher probability ( $OR = 3.1$ ) of having an HIV negative female partner than non-IDU heterosexual males and of using condoms ( $OR = 1.6$ ) (table w2 on website).

As seen among males, the results from univariate analysis did not change when adjusting for potential confounding factors (most of all, the higher number of lifetime sexual partners), though the association between having had sexual intercourse since testing positive lost its statistical significance. It is worth noting also that female IDU had a higher probability of having an HIV negative male partner than non-IDU heterosexuals ( $OR = 2.7$ ) (table w2 on website).

## Discussion

This study describes some aspects of sexual behaviour in a cohort of Italian heterosexuals with HIV infection naive for antiretroviral therapies at enrolment. Some of the main results of the study (namely, number of lifetime sexual partners and partner's HIV status) highlight differences in sexual lifestyles according to history of drug use that deserve attention for preventing the spread of the epidemic. Other main findings worth noting of this comparison targeted to preventive messages include the following: more non-IDU women than men reported having been infected by their regular partner whose HIV status they were not aware of at the time; more men than women reported they had a current partner who was HIV negative.

A number of limitations and strengths of the present research merit mention. Since the beginning of the AIDS epidemic, selection bias has been recognised as a major problem in studies of special population groups.<sup>11</sup> In this study, the population was composed of antiretroviral "naive" HIV infected people attending HIV clinics, and this implicit selection "bias" may limit the extent to which the results can be generalized to other populations. Moreover, the self reported questionnaire was completed by 72% of the individuals to whom it was offered, thus adding a further limitation regarding the external validity of the study findings. A comparison of the general characteristics of responders and non-responders showed, however, no significant differences between them. In addition, the distribution by age, sex, and mode of acquisition of HIV of people enrolled in this study, largely reflects that of AIDS cases reported in Italy during the study period.<sup>12</sup> Other biases may include underreporting of stigmatised behaviours and overreporting of normative behaviours, particularly when the sexual behaviours under



investigation are related to acquisition of HIV infection.<sup>13</sup> We have tried to partially overcome such potential drawbacks by using a coded self administered questionnaire that offered the advantage of privacy and efficiency.<sup>14 15</sup> With respect to recall issues and condom use only the most recent sexual encounter was taken into account in order to minimise recall bias and maximise reliability. While an individual's most recent sexual encounter may not be typical of "average" behaviour, it has other advantages—namely, that it is an unbiased selection of an event, and on a population level should reflect the true distribution of sample population's behaviour.<sup>16</sup>

One of the main strengths of the study is that it involves a large cohort of individuals with HIV infection in Italy, and is one of the few Europeans cohorts able to provide behavioural information on HIV infected patients naive for antiretroviral therapy. The study therefore provides a good opportunity to investigate the sexual behaviour of HIV infected heterosexuals before changes potentially induced by HAART.<sup>17-19</sup>

The proportion of people who said they were sexually active after they became aware of their HIV infection is consistent with that recorded in other studies on HIV infected people.<sup>20-22</sup> Our data suggest that, among males, IDU had an higher level of sexual activity compared with non-IDU. Almost half of the non-IDU females in our study reported having a sexual relationship with an IDU. Our observations, as well as those obtained in preceding surveys among different groups of heterosexual IDU in Italy,<sup>23 24</sup> indicate that in Italy the transmission of HIV from infected male IDUs to non-drug injecting females may be significant.

There may be several interpretations to explain the unexpected differences with respect to condom use that emerged between heterosexual IDU and non-IDU. First of all, some investigations have noted an association between condom use and the main partner's serostatus, with more consistent condom use being reported by HIV positive IDU with seronegative partners.<sup>25 26</sup> This observation is in part supported by our own data which indicate that more male and female heterosexual IDUs than non-IDU heterosexuals had a current partner who was HIV negative. Secondly, in accordance with previous observations that HIV positive IDUs are more likely to use a condom than HIV negative IDUs,<sup>27</sup> our finding point to a high frequency of condom use among HIV positive IDUs. This may possibly be indicative of behaviour change after notification of HIV infection, but our own data do not permit a conclusion to that effect. Some researchers have reported that HIV positive individuals show more risk reduction than those who test negative or who have not been tested at all.<sup>28</sup> We considered IDUs who said they acquired HIV infection through the use of injecting drugs, but we did not discriminate between former and current use, although substance abuse is often associated with risky behaviours, including unprotected sexual intercourse.<sup>29</sup>

Our study supports previous observations that a large proportion of people with HIV continue to be sexually active. This has major implications for the planning and targeting of HIV prevention activities, especially given the growing number of people who will live and function normally with HIV in an era of improved therapy. To what extent the needs of people with HIV, who are going to have these therapies available, are also going to have access to counselling and other support when and if they seek it, is not clear. But certainly more attention will have to be given to HIV prevention in this group and issues of risk behaviour change will need to be given very high priority. Our data, nevertheless, point to relatively wide variations in levels of sexual activity among people attending HIV clinics, and this too means that support for behaviour change and maintenance of safer sex behaviour will need to be carefully targeted and be evidence based. It would be inappropriate both in terms of cost and relevance, to assume that all people with HIV call for the same types of HIV prevention support. To this end, more careful monitoring of behaviour, attitudes, and responses by people with HIV is called for. Training of staff to be responsive to the new challenges that are emerging in an era of improved therapies will also have to be assessed and where necessary, strengthened. Programmes aimed at doing all this must become an integral part of primary care for people with HIV.

Our data also highlight the vulnerability of women to infection by partners whose HIV status they are not aware of. This remains a major challenge, especially, but not only in the context of improved therapies which might be linked to a lowering of attention to safe sex. How to reach the partners of people with HIV in ways that do not abuse confidentiality and which support the intent of people with HIV to avoid transmission of HIV need to be explored. In this respect more attention deserves to be given to encouraging joint counselling whenever and whenever possible.

In conclusion, this study identified some important differences, in both males and females with HIV infection, in sexual lifestyles according to history of drug use. This observation indicates the need to tailor HIV prevention messages according to history of injection drug use (for example, partner's HIV status).

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