HIV infection and associated risk behaviours in a prison in Montevideo, Uruguay

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ABSTRACT

Introduction: The aim of this study is to establish the prevalence of HIV infection and associated risk behaviours amongst inmates at the Montevideo Prison in 2005.

Materials and Methods: The prevalence of HIV infection and different risk practices were analysed in a sample of 191 individuals by means of a serological study and personal interview based on a structured questionnaire.

Results: A prevalence of 6.5% was found for HIV infection in prison. The variables that proved to be risk factors were: previous prison sentences (p=0.009; OR= 9.51; IC95%: 1.31-144.0), having had an HIV (+) sexual partner in the past (p=0.000025; OR=7.87; IC95%: 2.58-23.9), current relationship with an HIV (+) partner (p=0.0013; OR=14.24; IC95%: 2.84-70.65), intravenous drug use (p=0.0001; OR=22.6; IC95%: 6.87-78.9), intravenous drug use in prison (p=0.03; OR=4.93; IC95%: 1.10-22.81) and sharing needles (p=0.004; OR=12.5; IC95%: 1.72-114.7).

Key words: HIV. HIV Infections, Prisons, Prisoners, Prevalence, Risk-taking, Comparative Study, Uruguay.

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INTRODUCTION

High transmission of infectious diseases such as HIV/AIDS within prison is enhanced by a series of factors as: a high percentage of drug users among inmates: overcrowding, malnutrition, poor hygiene conditions, the fact that inmates belong to marginalized population groups, their vulnerability to diseases such as tuberculosis or AIDS and their risk behaviours such as sexual encounter among inmates and sharing needles[1, 2].

Sharing injection material entails a very effective way of transmission. In USA and Spain injecting drug use constitutes the main risk factor for becoming infected by HIV[3, 4, 5]. A study on HIV prevalence and injecting drug use was carried out in a Scottish prison (Glenochil) and revealed that 25% of injecting drug users (IDUs) took up drug consumption in prison and between 25 and 30% of them became infected with HIV in prison[6]. Other studies carried out in Spain conclude that the percentage of IDUs among inmates ranges between 22 and 38% depending on the region which was analyzed. The prevalence of HIV infection among IDUs ranges between 30 and 60%. A study carried out in the prisons of Castilla y León in 1998 concluded that the prevalence of HIV was 12.5% and the most important transmission way was parenteral drug use (94.7%)[7]. Over 50% of the inmates within the different prisons studied stated having shared injection materials[8, 9, 10].

Among male prisons worldwide, sexual encounter usually takes place. A survey carried out in 1993 in Rio de Janeiro revealed that 73% of male inmates had had sexual relationships with other men within prison [11]. Other studies carried out in Zambia. Australia and Canada revealed data ranging between 6 and 12%[12]. Relationships can be based on mutual agreement but can also be forced. In some prisons "rape" usually takes place and it even entails a standardized initiation method [1, 12]. The American Federal Bureau of Prisons reported in 1982 that 30% of federal inmates had had homosexual encounters during their imprisonment and between 9 and 20% had been victims of rape[13].

Tattooing, self-harm and injuries inflicted between inmates represent other ways of HIV transmission within the penitentiary context. Usually tattoos are made with non-sterilized equipment, therefore increasing the risk of viral transmission[1].

Other factors which increase the risk of becoming virally infected within prison are: a previous imprisonment record and the time of imprisonment, both of which entail an increased probability of being exposed to risk practices[1, 12].

The penitentiary community is very violent. This violence can be expressed in several ways, among which self inflicted injuries (cuts on the upper limb in protest) and injuries inflicted to other inmates with homemade knives are quite frequent. This behaviour entails an increased risk for becoming infected with HIV[14, 15].

HIV infection has been declared in many prisons worldwide although there is a lack of information available because of several factors such as fearing discrimination of seropositive inmates and the general lack of confidentiality within the penitentiary context, both of which compromise taking the HIV test, as well as the general attitude of penitentiary authorities, who deny the existence of HIV infection and its risk factors[16]. Nevertheless, in those countries where HIV prevalence among the general population has been compared to that of inmates, this has been found to be as far as 75 times higher [17]. In USA the rate of HIV infection is 6 times higher, both in federal and state prisons than in the general population. Between 20 and 26% of those who are infected with HIV in USA have spent some time in a correctional or penitentiary facility throughout their lives. A study on the prevalence of HIV carried out in 1990 among 9.080 inmates of federal prisons revealed a prevalence of 4%[18, 19].

In Brazil, it has been estimated that prevalence ranges between 14 and 15%. The Department of Health reckons that about 15% of the imprisoned population, about 150.000 inmates, is currently infected with the virus. Epidemiologists estimate that more people die in Brazilian prisons because of AIDS than due to any other cause, violence included. Therefore, every year, about 3.500 people infected with HIV are released from the penitentiary system in Brazil.

In Argentina, the Federal Prison System, which is in charge of about 6.600 inmates imprisoned in the Federal Capital, reported that by the end of 2002 the prevalence was 7% although they also admitted that it could be higher. A study which was carried out between 2001 and 2002 revealed that the prevalence of the viral infection exceeded 16%[23]. The latest official report in Uruguay on the prevalence of HIV among the imprisoned population dates from 1993, and it states 6%. In 2003, out of the 3.800 inmates imprisoned within the facilities of the Dirección Nacional de Cárceles y Centros de Reclusión (DNCYCR) (National Department of Prisons), 120 cases of HIV/AIDS had been reported, therefore concluding a prevalence of 3%[24].

Nevertheless, as it has been aforementioned, HIV/AIDS prevalence figures in prisons of Argentina and Brazil are much higher than ours, on the order of 16 and 14% correspondingly.

In our country, according to the data provided by the Department of Epidemiology of the Ministry of Public Health, as of 31st December 2008, there were 10.927 seropositive people; a prevalence of 0.46%[25].

In Uruguay there are several ways of imprisonment. Within DNCYR the following facilities are included: Tablada. Penal de Libertad. Complejo Carcelario de Santiago Vázquez (COMCAR). Centro de Reclusión N.1 (Tacoma) and Cárcel de Mujeres. Its reference area is the Department of Montevideo and the metropolitan area, including a population of about 1.300.000 people. As of the moment when this study was carried out (2005) it hosted 3.800 people among who both convicted and prosecuted inmates were included, about 53% of the total imprisoned population in the country. The facility Complejo Carcelario de Santiago Vázquez (COMCAR) is the largest confinement facility in the country, and at that moment counted upon 2.835 inmates, while its operational capacity was for 900.

The aim of the current study was to know the prevalence of HIV infection and its associated risk behaviours in the facility of Complejo Carcelario de Santiago Vázquez (COMCAR) in 2005, the first step towards facing the problem of the transmission of HIV and other frequent infectious diseases within prisons. This will allow us to take future measures to reduce the spread of the virus in prisons.

MATERIALS AND METHODS

Between February and May 2005 a descriptive cross-sectional study was carried out within the facility known as COMCAR, the most important prison in the country, hosting between 40 and 50% of Uruguay's imprisoned population, including primary inmates with minor crimes as well as extremely dangerous criminals, both from the capital and the interior of the country. Therefore the facility can be considered Uruguay's most representative male detention centre.

The sample included all the inmates confined in COMCAR located at about 20 km from Montevideo. The facility held 2.835 male inmates in six (6) different modules as of the moment of the study. To calculate the sample, the last official prison prevalence was used: 6% (p=0.06) with a 95% confidence level and a 3% precision (0.03). Although it would have been more appropriate to use a 1 or 2% precision, due to operational and resource availability reasons, a larger sample couldn't bee analyzed. The sample size was enlarged in 20% to prevent losses: the number of studied individuals was 291. These individuals were selected by means of systematic random sampling from the inmate registry in each of the modules in which the facility is divided. Thus, individuals were selected proportionally, according to the population held in each module.

The following variables were studied: HIV infection, education level, marital status, criminal record, detention module, injecting drug use inside prison, drug consumption record outside prison, sharing needles and syringes, homosexual encounters in prison, not consented anal penetration in prison (rape), HIV positive sexual partner, tattoos made in prison and self inflicted injuries. The information was gathered from primary and secondary sources. The secondary source was the records of the Legal Division within the penitentiary facility. Primary information was gathered by means of a personal interview to each inmate, which was carried out with a structured and pre-coded questionnaire at the same time as a 10ml peripheral blood draw for the ELISA test was taken, prior consent. Data was gathered by the authors of the study. Because the participants in the study could have more than one risk practice, all of them were recorded. All those cases which had been previously declared infected by HIV were included as such. According to the standard diagnosis algorithm for HIV the laboratory required a second blood test for all those inmates who had had a first reactive or unspecified determination for HIV. Nursing staff was responsible for taking the blood samples for the laboratory. Each sample had a label corresponding to a sequential number code used for the record form of the data. Samples were analyzed in the Penitentiary Hospital's laboratory. Samples which reacted to the ELISA test were sent to the Central Laboratory of Uruguay's Department of Health for their confirmation.

Each inmate signed informed consent forms in order to take part in the study. Special emphasis was made for the confidentiality of the information gathered and International Ethical Guidelines for Epidemiological Studies, and particularly the studies regarding people deprived of their freedom, were strictly observed (Geneva. CIOMS. 1991).

All the inmates accepted to take part in the study.

Data analysis was carried out with the statistical software EPIDATA 3. Summary measures included ratios, proportions and rates for qualitative variables. The prevalence for HIV infection was studied as well as the prevalence of associated risk practices and their corresponding 95% confidence intervals. For the quantitative variable "age" measures of central tendency were used: arithmetic mean and median and percentiles as measures of dispersion. Statistical association was determined by the Mantel – Haenszel chi square test and Fisher's exact test when the expected number in each cell was under 5. The fixed level of statistical significance was 0.05 ($p<0.05$). In order to achieve this study's purposes we considered "exposed inmate" as the one who gave affirmative answers to selected risk factors. Odds ration (OR) calculations and their corresponding confidence intervals were used as risk estimates in the group of exposed inmates.

The results of HIV tests were given to each of the participating inmates, as well as to the Head of the Prison Health Services.

RESULTS

The population under consideration was distributed in an age range between 18 and 74 years, with a significant prevalence of the age group of individuals under 30 years old. The average age of the sample was 29.6 and the median. 27. As far as the level of education is concerned, 6.5% of all inmates don't know how to read or write; only 21% completed primary education, 8% finished complete secondary education and the highest percentage agrees with those who started secondary education but didn't finish it (37.5%). The variable marital status reveals that half of all inmates are single and only about 15%

had turned to the Register Office, including married, divorced and widowed inmates. Unmarried partners counted up to 32.4% of all registries.

With regard to prison features, almost two thirds of the sample had spent over one year in prison. Over 67% of COMCAR's inmates have a criminal record.

As HIV infection is regarded, out of all polled inmates, 15 were diagnosed as seropositive for the virus and 4 of the blood tests taken to the rest (276) were positive by Western-Blot confirmation tests, therefore revealing a prevalence of 6.5% (95% CI:3.67-9.33) for the year 2005 in COMCAR (see Table 1).

Table I: Distribution of inmates according to HIV serology. COMCAR. Year 2005.

HIV Serology	AF	RF%
Positive	4	1.37
Known positive	15	5.16
Negative	272	93.47
Total	291	100

Table 2 shows the prevalence (P) of all risk group factors, which were searched with the study and whose answer was affirmative or negative. Those with a higher prevalence are: having spent over one year in prison (P=68.04), having a record of previous imprisonment (P=67.35) and tattooing while in prison (P=59.11). These are followed by self-inflicted injuries (P=37.80), a very widespread means of complaint (almost 4 of every 10). Having used injecting drugs outside prison is the next risk factor (P=15.12) followed by "having been exposed to an HIV (+) sexual partner" (P=10.65), over prison homosexuality (P=10.31). Practices with lower prevalence were: rape within prison (P=4.12), current HIV (+) partner (P=3.43), parenteral drug abuse in prison (P=4.47) and sharing injecting material (P=3.09).

Next, the results obtained when the variables were compared to the HIV (+) serology as a dependent variable are presented. The variables which revealed to be risk factors for HIV infection in prison were: previous imprisonment record (p=0.009; OR=9.51; 95% CI: 1.31-144.0); having had an HIV (+) sexual partner in the past (p=0.000025; OR=7.87; 95% CI: 2.58-23.9); currently having an HIV (+) sexual partner (p= 0.0013; OR= 14.24; 95% CI: 2.84-70.65); injecting drugs use (p=0.0001; OR=22.6; 95% CI: 6.87-78.9); injecting drugs use in prison (p= 0.03; OR=4.93; 95% CI: 1.10-22.81) and sharing injection materials (p=0.004; OR=12.5; 95% CI: 1.72-114.7).

Research on homosexual relationships in prison revealed the following results: (p=0.12; OR=2.51; 95%CI: 0.57-8.71), rape (p=0.18; OR=3.06; 95% CI: 0.30-16.18), age under 40 (p=0.74; OR=0.87; 95% CI: 0.22-3.94), education level under complete secondary education (p=0.75; OR=1.74; 95% CI: 0.25-75.5), being single (p=0.62; OR=0.79; 95% CI: 0.28-2.20), being married (p=0.41; OR=1.85; 95% CI: 0.40-7.44), tattoos made in prison (p=0.18; OR=2.02; 95% CI: 0.65- 6.69) and injuries in prison (p=0.06; OR=2.4; 95% CI: 0.85-6.87 (see Table 3).

Table II: Distribution of inmates according to the prevalence of prison Risk Factors in COMCAR. Year 2005.

Prevalence of HIV infection risk factors in prison	FR%	CI (95%)
Over one year of imprisonment	68.04	61.05-74.50
Imprisonment record	67.35	61.96-72.70
Tattoos made in prison	59.11	53.46-64.76
Injuries inflicted in prison	37.80	32.23-43.47
Injecting drug abuse outside prison	15.12	11.00-19.24
HIV (+) sexual partner in the past	10.65	7.11-14.20
Sexual encounter with other men in prison	10.31	6.82-13.80
Drug abuse in prison	4.47	2.10-6.84
Non consented anal penetration	4.12	1.84-6.40
Currently HIV (+) partner	3.43	1.34-5.20
Sharing injection material	3.09	1.11-5.07

Table III. Distribution of inmates according to exposure and positive serology for HIV. COMCAR. Year 2005

Exposure and serology for HIV (+) variables	n	OR	95% CI	p- value
Imprisonment record	196	9.51	1.31-144.0	0.009**
Over one year of imprisonment	198	0.31	0.11-0.88	0.011**
HIV (+) sexual partner in the past	31	7.87	2.58-23.9	0.000025**
Currently HIV (+) sexual partner	10	14.24	2.84-70.65	0.0013*
Previous injecting drug use	44	22.60	6.87-78.9	0.0001**
Injecting drug use in prison	13	4.93	1.10-22.81	0.03*
Sharing injection materials in prison	9	12.50	1.72-114.7	0.004*
Age under 40	251	0.87	0.22-3.94	0.74**
Education under complete secondary education	266	1.74	0.25-75.5	0.75**
Marital status married	19	1.85	0.40-7.44	0.41*
Marital status single	145	0.79	0.28-2.20	0.62**
Homosexual relationships in prison	30	2.51	0.57-8.71	0.12*
Non consented anal penetration	12	3.06	0.30-16.18	0.18*
Tattoos in prison	172	2.02	0.65-6.69	0.18**
Injuries in prison	110	2.40	0.85-6.87	0.06*

* Fisher's exact test **Mantel-Haenszel chi-square test

DISCUSSION

Social and demographic features amongst the sample researched don't seem to differ from imprisoned populations worldwide and in the region. In this report we can consider that the age is extremely young, in agreement with the long-established trend among imprisoned individuals throughout this century. The level of education sets a difference between this sample and the general population, with over 20% of inmates who had not finished secondary education, while the national average is about 10%. The percentage of illiteracy reaches 6.5%. As far as the marital status is concerned, half of the sample researched is single (53%) and unmarried partners count up to over 32% of all inmates.

With regard to prison features, it is noticed that few are "new inmates", something which is worth considering when we take into account that this prison serves as gateway to the system. Moreover, we find that over 70% have spent over one year in prison, as well as a high percentage of inmates with a criminal record, something which agrees with other studies [26].

Regarding HIV infection, it is worth underlining that a prevalence of 6.5% was revealed in COMCAR in 2005, therefore the prevalence rate had been doubled with regard to the last reported one in the facility, which dated from 2003 and was 3%, and it was 14 times higher than the rate found among the general population (0.46%). This can be due to several factors, amongst which it is worth highlighting an explosive increase of the imprisoned population, which can be partially explained because of the severe social, economic and financial crisis that our country underwent in 2002, and which lead to the collapse of the prison system and particularly of the facility of COMCAR, with subsequent overcrowding, promiscuity, lack of authority control in regulating the prisoners' living and the lack of an infrastructure which enables minimally appropriate hygiene conditions [24]. Other factors which are worth considering are the lack of public health policies specially targeted at this population, whose vulnerability is obviously a most

important feature, their low social and economic level: most of them come from the poorest and most marginalized communities, something which entails unequal assignment of health resources regarding both quality and quantity. It is worth considering too that apart from the aforementioned lack of resources, there is no care model in charge of education, health promotion and disease prevention, especially as far as sexually transmitted diseases are concerned.

With regard to researched risk factors, previous imprisonment record, self-inflicted injuries and tattoos made in prison, were the factors with a higher prevalence. Other practices which revealed lower prevalence were having abused from injecting drugs, having done so in prison, having had an HIV (+) sexual partner, homosexual relationships and rape within prison. As far as consented homosexual encounters are concerned, a study which was carried out in Brazil [11] revealed that it is a very widespread practice in over 70% of the imprisoned population, when compared to the prevalence found in our report which was slightly over 10%. Similarly, rape revealed a prevalence 4%, which is much lower than the figures provided by studies carried out in USA, where the prevalence ranged between 9 and 20%[13]. This could be explained by the fact that some of the interviews have been carried out by a woman and she might have not been able to create the appropriate confidence environment for obtaining more reliable answers, especially if we consider that male chauvinism is very widespread among this community. This could entail a limitation to the research as we could be facing some kind of biased information.

Something which we think it is worth taking note of, is the fact that due to the purchasing power of the Uruguayan population in general, and particularly among the imprisoned population, injecting drug abuse is an uncommon practice if compared to studies carried out in USA[3], United Kingdom[4,6] and Spain[7], where the prevalence was much higher. Nevertheless, although the percentage found was under 5%, harm reduction policies should be implemented by prison authorities, just as in the aforementioned countries and others.

This study reveals the significant risk increase in becoming infected with HIV among those inmates with previous imprisonment record, previous and current HIV (+) sexual partners and among injecting drug users and those who shared injection materials.

This study revealed that over one year of imprisonment was not a risk factor, in opposition to our initial hypothesis. This discrepancy with regard to other studies[9] can be explained by insufficient sample size, so that a larger study could reveal a different result. On the other hand and despite the aforementioned limitations as well as those derived from cross-sectional studies, the sample was obtained by systematic and random sampling techniques, so that its representativeness can be ensured and the possibility of biased selection can be discarded.

We can conclude that the prevalence found in our study was 6.5% and risk factors associated to an increased probability of becoming infected with HIV in prison were: having had previous HIV (+) sexual partners, current HIV (+) sexual partner, being injecting drug users, and among them those who did so in prison and who shared injecting materials. With regard to strictly penitentiary factors, only previous imprisonment record proved to be a risk factor.

The rest of the variables did not achieve statistically significant values. This is partially due to the limitations derived from the size of the sample and due to the possible bias derived from the fact that the questionnaire was not self administrated. This complicates the admission of some practices by inmates and can have an effect on their answers, particularly as far as some very private issues are concerned: such as rape, homosexual encounters or injecting drug abuse within prison. This can explain the differences observed with regard to other reclusion facilities, where risk behaviours were much more frequent than those gathered in our study.

The results of this study could be used to improve life and health conditions within the penitentiary facility, as well as to raise awareness among prison authorities regarding the relevance of enhancing information, education and health promotion policies, particularly as far as sexually transmitted diseases and HIV/AIDS are concerned. More studies are needed to acquire a better knowledge of the situation of inmates so as to create changes and enhancing behaviours that will support their rehabilitation and social reinsertion.

CORRESPONDENCE

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