

Characteristics and clinical condition of the inmate population infected with HIV in the spanish penitentiary centres

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ABSTRACT

Objectives: To know the socio-demographic and clinical characteristics of the HIV positive inmates.

Patients and Methods: Observational and cross-sectional study. The first 25 patients of 8 Penitentiary Centres, scheduled for a medical consultation on a designated day of July 2003, have been chosen for this study. 199 patients were analysed.

Results : 76,4% of the inmates studied have been in prison for more than 3 years. 92,5% of them have injecting drug use (IDU) records. 21,6% of them reported to consume heroine and/or cocaine at present. 132 (66,3%) are under methadone treatment. 32 patients have suffered from TB and 35,2% from LTBI (Latent Tuberculosis Infection). 178 out of 193 (92,2%) showed HCV antibodies, 150 out of 189 (79,4%) showed HBC Ac. positive. 11 out of 186 (5,9%) showed HBsAg positive. Of the 178 patients co-infected with HCV, 65 (36,5%) have undergone a PCR for virus C, and it is positive in 62 (95,4%). 44 (22,3%) meet AIDS criteria. 32 (16,8%) showed CD4 <200. The mean CD4 corresponds to 443,3 ($\pm 251,0$). 110 (55,3%) have received some antiretroviral therapy. 106 (54,8%) are receiving ARV therapy at the moment, and of the 192 who have undergone a PVL for HIV it is <400 in 82 (42,7%) of them.

Conclusions: The control of the HIV infection in the penitentiary population is adequate, on average patients show a good clinical condition. Programs for the control and treatment of the viral hepatitis need to be established.

Key Words: Inmates, HIV, HCV, clinical condition.

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INTRODUCTION

Many papers demonstrate the existence of differential characteristics within patients infected with the Human Immunodeficiency Virus (HIV), comparing prison inmates with the population at large infected with HIV in aspects such as risk behaviours, Acquired Immunodeficiency Syndrome (AIDS)-defining diseases and co-infection with different viruses of hepatitis.

This study aims at showing other clinical aspects of patients incarcerated in the Spanish prisons and in-

fectected with HIV, and on the other hand evaluate if the study of diseases such as the viral hepatitis is regularly carried out by clinicians in the prison setting, since new efficient treatments have again drawn attention to them.

The principal objective of this study is to describe the socio-demographic, penitentiary and clinical characteristics of patients infected with HIV in eight Spanish centres. A secondary objective is to estimate the proportion of patients who have carried out diagnosis tests for the most prevalent diseases in prisons.

MATERIAL AND METHODS

Observational and cross-sectional study. The sample size was calculated at an estimated risk of 0,05%, a risk of 0,2%, a precision of 3%, a prison population infected with HIV of about 8,000 people, and proportions of the characteristics to be studied (sex, no co-infection with HCV, co-infection with HBV) estimated at 5% approximately. The sample was obtained, following the method used in sentinel surveillance systems⁷, by means of the selection of the first twenty-five HIV infected patients, scheduled for a medical consultation with 8 research clinicians – working in 8 different penitentiary centres located all over Spain, and representing the different types of centres (preventive, correctional, and mixed) on an designated day of July 2003, and independently of any other factor. If twenty-five patients were not found in the initial consultation scheduled, they were selected in the following ones. The variables collected were: age, sex, length of stay in the centre where the study was carried out, total length of stay in prison, personal records, drug addiction data – injecting drug use (IDU) behaviour and length, drug consumption in prison, and treatments with methadone or psycho medicines, medical examination data – weight, height, existence of tattoos, and dental examination results, serological tests conducted – syphilis and viral hepatitis, co-infection with Hepatitis C Virus (HCV) data – qualitative and quantitative RNA for virus C, genotype, aminotransferase levels and HIV infection data – year the first positive serology test was carried out, classification of the HIV infection according to the CDC, AIDS-defining disease, last HIV plasma viral load (HIV PVL) conducted in the last three months before the data collection (the level of undetectable HIV viral load in the participating centres varies from 20 to 400 copies), CD4 lymphocyte sub-populations in the same terms as the HIV viral load and CD4 nadir grouped according to counts <200, 200 – 500, and > 500 cells/mm³ (for the CD4 nadir counts, the CDC classification was followed) antiretroviral medicines that patients have taken and medicines that they were taking at the moment the study was conducted.

Most of the data have been collected from the patients' medical records, other data during the medical consultation and some by means of the medical examination. Data Collection Forms (DCF) used for this study, shall not show, the serological or analytical data obtained after the day selected for the data collection, since one of the objectives of this study is to evaluate the percentage of patients who had initiated and completed the study of their diseases.

The qualitative variables are described by means of frequencies and percentages. The Kolmogorov-Smirnov test was used in order to establish the type of distribution the quantitative variables followed. If their distribution was parametric, mean and standard deviation was used, for a non-parametric distribution, mean and percentages 25-75 were used. In order to compare parametric quantitative variables between groups, the analysis of variance (ANOVA) was used. The Kruskal-Wallis as well as the U. de Mann-Whitney tests were used for the non-parametric distribution. The Chi-square test was used for the association study within qualitative variables.

The SPSS 10.1 software has been used for the analysis of data.

RESULTS

200 patients were selected and 199 were analysed as a results of defects in the data collection of one patient (negative Western blot test). The mean age of the patients included in the sample is 36 (± 6) years. 96% of patients (191) are men and only 8 (4%) are women.

Patients were grouped according to the time they have spent in prison during their life and also according to the time spent in the prison where the data collection has been carried out, as shown in Table 1. This has been done for the total number of patients included in the study as well as distributed per prison.

33 patients (16%) show TB personal records, 20 (10%) show psychiatric records, 15 (7,5%) oral candidiasis, 14 (7%) pneumonias, 7 (3,3%) epilepsy, 6 (3%) COPD, 6 (3%) Herpes Zoster and 2 patients (1%) showed syphilis records.

A large majority of patients – 184 (92,5%) – showed IDU records. The mean time that has passed since they have initiated this practice up to the data collection corresponds to 196,8 (± 86.4) months. 54,3% (108) of them reported to continue consuming drugs compared to 45,7% who don't. 28 patients (14,1%) reported to consume heroin, the same number of patients reported to consume cocaine, (and within those, 13 consume both drugs). One patient (0,5%) reported to consume synthetic drugs and 94 (47,2%) cannabis. 132 patients (66,3%) are under methadone treatment, 130 (65,3%) under benzodiazepins treatment and 49 (25,3%) under neuroleptics treatment.

The data provided by means of the physical examination show that the mean weight of the 199 patients is 67.8 ($\pm 10,4$) kilos. The mean height of the 175 patients (those whose height was available) is 170 (165-175) centimetres. 140 (70,4%) patients have tattoos.

	Length of stay in the centre			Length of stay in prison			Total n (%)
	<6 months n (%)	6-12 months n (%)	> 12 months n (%)	6-12 months n (%)	1-3 years n (%)	> 3 years n (%)	
Puerto II	16 (64)	7 (28)	2 (8)	2 (8)	8 (32)	15 (60)	25 (100)
Barcelona	13 (52)	8 (32)	4 (16)	1 (4)	2 (8)	22 (88)	25 (100)
Alicante	11 (44)	11 (44)	3 (12)	5 (20)	7 (28)	13 (52)	25 (100)
Castellón	4 (16,7)	5 (20,8)	15 (62,5)	3 (12,5)	1 (4,2)	20 (83,3)	24 (100)
Córdoba	4 (16)	7 (28)	14 (56)	0	8 (32)	17 (68)	25 (100)
Nanclares	4 (16)	1 (4)	20 (80)	2 (8)	2 (8)	21 (84)	25 (100)
Mansilla	1 (4)	4 (16)	20 (80)	2 (8)	2 (8)	21 (84)	25 (100)
Madrid IV	1 (4)	3 (12)	21 (84)	0	2 (8)	23 (92)	25 (100)
TOTAL	54 (27,1)	46 (23,1)	99 (49,8)	15 (7,5)	32 (16,1)	152 (76,4)	199

Table I. Length of stay in the centre where the study was carried out, and total time of incarceration of patients.

	POSITIVE	NEGATIVE
Serology	n (%)	n (%)
RPR (N=158)	12 (7,6)	146 (92,4)
TPHA (N=158)	7 (4,4)	151 (95,6)
Anti-HCV * (N=193)	178 (92,2)	15 (7,8)
HBc Ac (N=189)	150 (79,4)	39 (20,6)
HBs Ac (N=168)	95 (56,5)	73 (43,5)
HBs Ag (N=186)	11 (5,9)	175 (94,1)
HBe Ag (N=6)	2 (33,3)	4 (66,7)
HD Ac (N=1)	1 (100)	0 (0,0)
HAV Ac Ig G (N=27)	16 (59,3)	11 (40,7)

N= patients who have had a serological test carried out

*3 (1,5%) patients with triple co-infection HB-HC-HIV

Table II. Serology obtained from 199 patients according to the result and the number of patients who have carried out each test.

With regards to the dental health and hygiene, of the 197 patients providing data, 169 (85,8%) of them have cavities and 169 (85,8%) miss a tooth or a piece of tooth.

Of the 28 cases of TB diagnosed in prison, 11 (39,3%) showed a reaction to the Mantoux test > 5 mm, 8 (28,6%) showed TB lesions on radiography and 9 (32,1%) showed positive culture on Lowenstein. 6 cases of positive microscopic smear test were reported. 3 of them had previously been treated for latent TB infection. 22 (78,6%) out of the 28 patients received treatment based on the Directly Observed Therapy (DOT), 2 (7,1%) did not receive DOT treatment and 4 (14,3%) received treatment but the regimen is unknown.

Of the 167 patients with no TB records, 146 (87,4%) have had a Mantoux test carried out and 70 of them (47,9%) were diagnosed with LTBI (Latent

Tuberculosis Infection). Of the 70 patients who tested positive to the Mantoux test and 6 who tested negative, 44 (62,8%) of them received LTBI treatment. 33 cases completed treatment (75% of those who had initiated it).

The serological analysis collected, including the frequency they were conducted and the positive results obtained, are shown in Table 3.

Within the sample, only 2 (1%) patients were vaccinated against hepatitis A. 9 (4,5%) of the patients with HBC Ac. and HBS Ac. negative have not initiated the vaccination against HB and 9 (4,5%) patients with unknown serology have not initiated it either. 49 vaccination regimens against hepatitis B have been initiated, of which 24 have been completed. No DNA for virus B determination has been carried out on

Status	N (%)
A1	46 (24,5)
A2	46 (24,5)
A3	16 (8,5)
B1	7 (3,7)
B2	18 (9,6)
B3	13 (6,9)
C1	2 (1,0)
C2	15 (8,0)
C3	25 (13,3)
TOTAL	188 (100)

* Two patients have been classified as C (AIDS case) but CD4 counts were not shown.

Table III. Classification of the HIV infection according to the CDC *

Treatment	CD4 <200		CD4:200-500		CD4>500	
	nadir N (%)	current n (%)	nadir n (%)	current n (%)	nadir n (%)	current n (%)
Under ARV	41 (75,9)	24 (75)	46 (58,2)	53 (60,9)	15 (27,3)	28 (39,4)
No ARV	13 (24,1)	8 (25)	33 (41,8)	34 (39,1)	40 (72,7)	43 (60,6)
Total	54 (100)	32 (100)	79 (100)	87 (100)	55 (100)	71 (100)

Table IV. CD4 nadir counts at the moment the study was conducted associated with ART (antiretroviral treatment)

HBS Ag positive patients. Of the 178 patients co-infected with HCV, 65 (36,5%) have undergone a PCR for virus C and it is positive in 62 (95,4%) of them. 45 patients (25,3%) out the 62 (72,6%) infected with chronic hepatitis C (CHC) have had a Virus C genotype test carried out. The results obtained show that 48,9% of them corresponded to genotype one, 2,2% to genotype two, 24,4% to genotype three and 24,4% to genotype four.

Within the sample studied, liver biopsies have been conducted on 9 patients and treatment against chronic VHC has been initiated in four cases.

Data regarding the aminotransferase levels were obtained in 171 patients, with a mean AST value of 42 (30-66). Mean ALT corresponds to 49 (31-81) and mean GGT is 55 (31-107).

The time passed in years from the date the HIV infection was diagnosed until the date of the data collection was calculated in 185 patients, showing a mean of 97.2 (± 60) months.

Data regarding the classification of the HIV infection according to the CDC have been obtained in 188 (94,5%) patients, as shown in Table 3. Two patients had a partial classification (only clinical) corresponding to C, and three patients showing pulmonary TB in their records were already suffering from it before 1992, so an AIDS-defining disease was not considered.

Of the 44 patients classified as group C (AIDS), data collected show that there were 40 cases of AIDS-defining diseases. There were 28 notable cases (66,6%) of tuberculosis. Esophageal candidiasis, Pneumocystis carinii pneumonia and recurrent pneumonias were found in three cases each (7,1%), extra-pulmonary cryptococcosis was found in two cases, progressive multifocal leukoencephalopathy and invasive cervical carcinoma was found in one. However, two patients showed two AIDS-defining diseases.

192 (96,5%) patients have had an HIV PVL carried out in the three months prior to the data collection. In 50 (26%) patients PVL was inferior to 50

copies RNA/ml, and in 82 (42,7%) it was inferior to 400. Patients' mean viral load with more than 400 copies corresponded to 10,950 (2,208-48,800). Within patients under ARV therapy, 60 (57,1%) have an HIV PVL inferior to 400 copies.

The mean CD4 counts of the 190 patients who had carried out this test corresponds to 443 (± 251). Table 4 shows the distribution of patients according to the CD4 counts at the moment of the study and according to the CD4 nadir counts depending on whether patients are under ARV therapy or not.

With respect to the patients' condition associated with antiretroviral therapy (ART), 71 (35,7%) resulted to be ART-naïve. Of the 199 HIV positive patients, 110 (55,3%) had received some ART before the survey was conducted.

110 patients were once given NRTI, 6 (5,4%) of them took NRTI and 59 (53,6%) of them took NNRTI. Finally, regarding Protease Inhibitors (PI), 57 patients (out of 110) have experience with this therapeutic group.

Medicines	n (%)
zidovudine	56 (52,8)
lamivudine	79 (74,5)
abacavir	13 (12,2)
didanosine	28 (26,4)
stavudine	41 (38,7)
tenofovir	12 (11,3)
efavirenz	20 (18,9)
nevirapine	24 (22,6)
indinavir	12 (11,3)
nelfinavir	9 (8,5)
Ritonavir*	5 (4,7)
saquinavir	4 (3,8)
lopinavir/ritonavir	21 (19,8)

* ritonavir always in baby doses

Table V: Medicines shown in ART regimens at the moment the study was conducted

	VL<400 n (%)	VL>400 n (%)	TOTAL n (%)
Three NRTI	8 (44,4)	10 (55,6)	18 (100)
Two NRTI+NNRTI	26 (60,5)	17 (39,5)	43 (100) NS
Two NRTI+PI	26 (59,1)	18 (40,9)	44 (100)

One patient with an NNRTI regimen has no VL carried out.
NS: Not significant

Table 6: Proportion of VL < 400 according to ART regimens

Of the 199 patients, 106 (54,8%) are currently receiving ART. The mean duration of this treatment is 15.7 ($\pm 18,1$) months. 18 (17%) patients have a regimen which includes three NRTI or NRTIt. 44 (41.5%) patients have a regimen of two NRTI + one NNRTI, and 44 (41,5%) a regimen of two NRTI + one PI.

Table 5 shows the distribution of the medicines, composing the triple therapy, that 106 patients were taking at the moment the study was conducted.

There are no significant differences within the proportion of patients with HIV PVL inferior to 400 copies RNA/ml, according to the ARV regimen they are taking (Table 6).

Ten (23,8%) of the patients with AIDS-defining diseases who have carried out diagnosis tests do not receive ART.

Patients treated with ART show ALT and AST counts slightly inferior to those who do not receive ART, and their GGT counts are superior, although with no significative differences.

DISCUSSION

This study provides a day to day description of the social and health condition of Spanish prison inmates infected with HIV. Giving the number of patients included, as well as their selection, although it has not been at random, this study has been carried out by centres homogeneously distributed all over Spain and includes all the possible characteristics of Spanish prisons.

The first aspect that stands out in this study is the extensive time these patients have been incarcerated. If the time spent in the prison where the data were collected is analysed according to centres (figure 1), we can observe that there are centres in which patients remain during a long period of time (Madrid IV, Mansilla and Nanclares), centres in which mobility is high (Puerto, Alicante and Barcelona) and cen-

tres that combine both situations (Córdoba and Castellón). These data show the high rotation that patients infected with HIV have in prisons, situation which can make the control of their diseases difficult, and which require additional efforts⁸.

Although personal psychiatric records are probably over-estimated (this datum was exclusively collected by means of the clinical history), the proportion of patients with epileptic and psychiatric history is notable. If the high number of patients treated with psycho-medicines and/or methadone is added to this figure, together with the fact that 50% of the sample reported to consume drugs, we must take into account that the main problems of patients infected with HIV in prison is drug-addiction and psychiatric co-morbidity.

The TB co-morbidity presented also stands out. Considering the fact that some patients will be anergic, at least 51,3% of patients are infected with TB or have suffered from it, this figure is much higher than those found in other studies⁹.

Co-morbidity is also high in other infections, since 79,4% of patients have been in contact with the hepatitis B virus (HBV) and 5,9% of them show a HBV chronic infection. The co-infection with the hepatitis C virus corresponds to 92,2%, this figure is superior to that of the HIV population at large which corresponds to 64%¹⁰. The frequency of HBV, HAV and hepatitis Delta virus (HDV) complementary serological tests carried out by the patients included in the sample is surprisingly low compared to the high number of them who have had the basic HBV and HCV serological tests carried out.

The number of patients who have undergone HB virological studies (none out of 11) or hepatitis C studies is also very low, since one RNA determination for virus C was carried out in only 36,5% of them. Considering this figure according to prisons, we can observe that in three prisons, more than 60% of patients infected with HCV have had an RNA test carried out, in two prisons this proportion varies between 20 and 25%, in two proportions are inferior to 10% and in one, none of them have had this test carried out.

As a consequence of the above figures, the number of biopsies conducted and the number of treatments initiated are also very low. In three prisons, no patients have had biopsies carried out, and in one, 44,4% of them have. Regarding treatments, only two prisons have patients infected with chronic HCV under treatment.

Concerning the HIV infection, the most outstanding aspect, initially, is the very high number of

patients who have had diagnosis tests and controls of their disease carried out, as well as the number of them under treatment. The mean period of time that patients have been IDUs, 197 months, contrasts with the 97 months from which their HIV infection has been identified. This is a very important difference which should not be considered as a consequence of a late diagnosis but which comes to confirm that many patients infected with HIV, were not included in the health systems before entering prison.

The patients' clinical condition with regard to the HIV infection is globally good and can be demonstrated on the basis of:

- The virological condition of patients with respect to the HIV infection is acceptable. 42,7% of patients have a PVL inferior to 400 copies, and the mean of those who have a PVL superior to 400 copies is relatively low (10,950 copies). On the other hand, the percentage of those with a viral load inferior to 400 under treatment corresponds to 57,1%.
- The immunological condition of patients is also good, with a mean CD4 of 443 (± 251) and only 16.8 % of the sample have a CD4 inferior to 200, when 28,7% have had nadir counts inferior to 200.
- The percentage of patients under treatment is also high. It is notable that only 10 patients out of the total number of patients, who according to the guidelines should be receiving treatment, are not (CD4<200 or with a clinical event C). This shows a very high level of prescription for a setting such as a prison, with complex patients and a high rejection to treatment.
- A quarter of patients (42) are AIDS cases, and as it has been notified previously¹¹, most of these cases (66,6%) were declared as having TB as the defining disease.

Other aspects to highlight are the proportion of patients who are ART-naive, 35,7%, as well as the high percentage of patients who are treated with three NRTI — some of them would not be prescribed at present — or with PI which are currently considered a second or third-line therapy.

In conclusion, the control of HIV patients in the penitentiary setting is good, as demonstrated in other studies¹², but programs must be implemented^{13, 14} in order to improve the control of chronic viral hepatitis and to increase the possibilities of patients being treated, programs with that aim have already been established.

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