Original short

RESP

Factors associated with sexually transmitted diseases amongst female prison inmates in Peru

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ABSTRACT

Objectives: The number of women in prison is rapidly increasing every year and it is important to establish what factors are related to the probability of presenting STDs in this population to enable health control policies to be established.
Material and method: An analysis was carried out on the open database of the national prison population survey conducted in 2016 in all Peruvian prisons. The study was based on the census and all female and male adults in prison were surveyed using a validated questionnaire.
Results: The sample consisted of 4,574 inmates in 67 institutions, covering 98.8% of the inmate population. It was found that presenting tuberculosis (PR: 2.64; CI 95%, 1.32-5.26), HIV/AIDS (PR 6.54, CI 95% 1.52-28.18), hepatitis (PR: 4.01; CI 95%, 1.23-13.11) and drug use (PR: 2.44; CI 95%, 1.32-4.52), are statistically related ($P \leq 0.05$) are factors associated with the presence of STDs in the multivariate model with a $P \leq 0.05$.
Discussion: The inclusion of associated factors (tuberculosis, HIV/AIDS, hepatitis and drug use) should be part of the strategy to control and treat STD in women's prisons in Peru.

Key words: sexually transmitted diseases; female; epidemiology; prisons.

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INTRODUCTION

11 million people are incarcerated worldwide, and it is estimated that 3-7% of this population are women. The prevalence of HIV, STD, hepatitis B and C, and tuberculosis in the prison population is from two to ten times greater, and in some cases even 50 times higher than it is in the community. Specific data about the female prison population is scarce, although it is believed to be growing, as is the male population, and for the same reasons[1-3].

The overall inmate population is increasing rapidly, which makes it essential to prepare interventions for HIV and STD in prison settings, both for inmates and for their families and relatives[1,4].

There are no prevention, treatment and care programmes for HIV and STD in prisons and other detention centres in regions such as Latin America and Africa. Few countries apply programmes to the prison setting and there are many that do not link existing programmes in prisons with national campaigns against AIDs, tuberculosis or public health programmes. Few prisons provide adequate services to female inmates, although they are aware that they form a special population given the possibility of STD and pregnancy[5-7].

Women, especially adolescent girls, may run the risk of infection from HIV and STD in prison, due to exposure to situations of violence, alcohol or drug use and lack of medical advice, all of which make it important not only to be aware of this situation of but also to implement preventive actions for HIV and STD in this special population[8-11].

There are few studies that evaluate this problem in the female prison population. Most research focuses on male populations, given that there are more male inmates with a consequently greater impact on the overall population[12,13].

We carried out a study with information gathered in 2016 at all Peruvian prisons, with a view to discove-

ring the factors associated with STD amongst female inmates.

MATERIAL AND METHOD

A retrospective study of secondary sources was carried out, using the public database of the Peruvian National Institute of Statistics and Information Technology (INEI) of the first Peruvian National Prison Census of 2016[14], in collaboration with the General Directorate of Criminal and Penal Policies and the National Institute of Prisons (INPE).

The sample consisted of 4,574 inmates from 67 prisons in Peru, located in 23 regions of the country and the Constitutional Province of Callao, with a coverage of 98.8% of the prison population. The variables that had some relevance to the issue were selected while the others related to factors associated with STD were organised.

Socio-demographic variables

Age (question 18), marital status (question 13), educational level (question 104), religion (question 16) and sexual orientation (question 112).

Age was categorised into three groups: under 20 years, from 21 to 40 years and 41 years or over.

The relationship was categorized as stable (married or cohabiting) and without a stable partner (single, divorced or separated, and widowed).

The following classifications were used for the educational level: no studies (without qualifications or primary education), primary (completed or not completed) and secondary (completed or not completed).

Religion was divided into three categories: Catholic, other religions and no religion.

Sexual orientation was divided into: heterosexual, bisexual, homosexual and no answer.

Variables associated with sexually transmitted diseases

Diagnosis of tuberculosis-(question 107.4), HIV/AIDS (question 107.6), hepatitis (question 107.7); the following variables were also assessed: drug consumption before entering prison (yes or not) (question 109.2), alcohol consumption before entering prison (yes or no) (question 109.2), if inmate smokes (yes or no) (question 109.3).

The STD variable was established in question 107.5.

Statistical analysis

Fisher's exact test or the chi squared test were used, depending on each case, for the bivariate analysis. Poisson's model was used for the multivariate analysis, while $p < 0.05$ was chosen as a statistically significant value. The statistical data and tables were analysed with the Stata v. 17 programme. The associations between variables in the bivariate analysis are entered as prevalence ratios or PR in the multivariate analysis.

Ethical considerations

The study was carried out with a database in the public domain, the Peruvian National Prison Census of 2016 (available at: https://proyectos.inei.gob.pe/iinei/srienaho/Descarga/FichaTecnica/512-Ficha.pdf), which does not allow the subjects' identity to be established and ensures that the data is confidential, thus doing away with any potential ethical conflicts. The study was revised and approved by the ethical committee in document 085-2022-VI-UC.

RESULTS

The study was carried out on the open database of the INPE, consisting of 4,574 inmates in all the prisons in the country. It includes all the answers marked as affirmative in the questionnaire.

The population was made up mostly of young women (59.40% between 20 and 40 years of age), with high rates of a background of tuberculosis (7.25%), consumption of drugs (32.39%) and alcohol (67.68%), mostly heterosexual (97.66%) and with no stable partner (65.37%) (see answers in Table 1).

The factors associated with STD can be seen in Table 2.

A statistically significant association (≤0.05) was observed in the following variables: tuberculosis, HIV/AIDS, hepatitis, drug use, type of alcohol and sexual orientation, with the likelihood of presenting an STD in the population studied.

Table 3 shows the analysis of the association of factors linked to the presence of STD amongst the Peruvian female prison population in the multiple regression model, where it was found that the factors of tuberculosis (PR: 2.64; CI 95%, 1.32-5.26), HIV/AIDS (PR 6.54, CI 95% 1.52-28.18), hepatitis (PR: 4.01; CI 95%, 1.23-13.11) and drug use (PR: 2.44; CI 95%, 1.32-4.52), are statistically related ($P \leq 0.05$).

DISCUSSION

The data of the population that we studied showed that tuberculosis, HIV/AIDS, hepatitis and drug use variables are significantly related in the multivariate model to the likelihood of the Peruvian female prison population presenting STD.

Tuberculosis is a common problem in the prison population as a whole, and is frequently associated with STDs in several studies found in the bibliography. Factors such as prison overcrowding, lack of awareness of the mechanisms of transmission, poverty and drug abuse have frequently been related to the coexistence of both diseases in many articles published in Europe, Asia and Latin America. It is important to point out that according to some studies[15,16], inmates showed a positive association between tuberculosis and HIV infection.

HIV/AIDS is the health diagnosis most frequently associated with the presence of sexually transmitted diseases in the prison population. Many studies have established a relationship between both diseases, especially in prisons. Another point to note is that where women are concerned, there are added problematic factors such as co-infection from vertical transmission in the case of pregnant inmates, lack

Table 1. Socio-demographic characteristics of the female prison population in Peru.

Characteristics	n	%
Sexually transmitted diseases		
No	4,504	98,88
Yes	51	1,12
Age (years)		
Under 20	102	2,23
Between 20 and 40	2,717	59,40
41 and over	1,755	38,37
Tuberculosis		
No	4,221	92,75
Yes	330	7,25
HIV/AIDS		
No	4,522	99,47
Yes	24	0,53
Hepatitis		
No	4,496	98,92
Yes	49	1,08
Drug use		
No	3,081	67,37
Yes	1,481	32,39
Type of drugs consumed		
Marijuana	784	52,94
Inhalants	20	1,35
Cocaine sulphate / cocaine or crack	673	45,44
Other types of drugs	4	0,27
Inmate's age when drug consumption commenced (years)		
20 and under	1,291	87,17
Over 21	189	12,77
Alcohol consumption		
No	1,471	32,17
Yes	3,095	67,68
Type of alcohol		
Beer	2,788	90,08
Chicha (corn liquor)	37	1,20
Spirits	37	1,20
Other types of alcohol	233	7,53
Inmate's age when alcohol consumption commenced (years)		
20 and under	2,822	91,33
Between 21 and 40	263	8,51
Over 41	5	0,16
Educational level		
No education/initial education	131	15,88
Incomplete/complete primary	217	26,30
Incomplete/complete secondary	477	57,82
Sexual orientation		
Heterosexual	3,011	97,66
Bisexual	48	1,56
Homosexual	24	0,78
Relationship with partner		
No stable partner	2,990	65,37
With stable partner	1,584	34,63
Religion		
Catholic	2,901	63,42
Other	1,499	32,77
None	174	3,80

Note. HIV: human immunodeficiency virus.
Source: National Institute of Statistics and Information Technology, National Census of the Prison Population of 2016.

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Table 2. Bivariate analysis of the factors associated with STD in the female prison population of Peru.

Variables	STD		*P*
	No (n = 4504) n (%)	Yes (n = 51) n (%)	
Age (years)			
Under 20	101 (99,02)	1 (0,98)	0,915
Between 20 and 40	2.674 (98,93)	29 (1,07)	
41 and over	1.729 (98,8)	21 (1,20)	
Tuberculosis			
No	4.170 (99,07)	39 (0,92)	≤0,05
Yes	318 (96,36)	12 (3,64)	
HIV/AIDS			
No	4.467 (99,02)	44 (0,98)	≤0,05
Yes	16 (66,57)	7 (30,43)	
Hepatitis			
No	4.438 (98,95)	47 (1,05)	≤0,05
Yes	44 (91,67)	4 (8,33)	
Drug use			
No	3.054 (99,38)	19 (0,62)	≤0,05
Yes	1.441 (97,83)	19 (0,62)	
Type of drugs consumed			
Marijuana	769 (98,34)	13 (1,66)	0,037
Inhalants	19 (95,00)	1 (5,00)	
Cocaine sulphate/ cocaine or crack	650 (97,45)	17 (2,55)	
Other types of drugs	3 (75,00)	1 (25,00)	
Inmate's age when drug consumption commenced (years)			
20 and under	1.255 (97,67)	30 (2,33)	0,268
Over 21	185 (98,93)	2 (1,07)	
Alcohol consumption			
No	1.453 (99,32)	10 (0,68)	0,054
Yes	3.046 (98,67)	41 (1,33)	
Type of alcohol			
Beer	2.753 (98,99)	28 (0,01)	≤0,05
Chicha (corn liquor)	32 (86,49)	5 (13,51)	
Spirits	34 (91,89)	3 (8,11)	
Other types of alcohol	227 (97,84)	5 (2,16)	
Inmate's age when alcohol consumption commenced (years)			
20 and under	2.778 (98,72)	36 (1,28)	0,08
Between 21 and 40	260 (98,86)	3 (1,14)	
Over 41	4 (80,00)	1 (20,00)	
Educational level			
No education/initial education	130 (99,24)	1 (0,76)	0,86
Incomplete/complete primary	215 (99,08)	2 (0,92)	
Incomplete/complete secondary	472 (99,37)	3 (0,63)	
Sexual orientation			
Heterosexual	2.967 (98,83)	35 (1,17)	≤0,05
Bisexual	43 (91,49)	4 (8,51)	
Homosexual	22 (91,67)	2 (8,33)	
Relationship with partner			
No stable partner	2.950 (98,54)	28 (1,46)	0,114
With stable partner	1.554 (99,25)	23 (0,75)	
Religion			
Catholic	2.852 (98,69)	38 (1,31)	0,189
Other	1.480 (99,26)	11 (1,15)	
None	172 (98,88)	51 (1,12)	

Note. STD: sexually transmitted diseases.
Source: National Institute of Statistics and Information Technology, National Census of the Prison Population of 2016.

Table 3. Bivariate analysis and multiple regression.

Variables	Bivariate analysis			Multiple regression*		
	PR	CI 95%	*P*	APR	CI 95%	*P*
Age (years)						
Under 20	Ref.					
Between 20 and 40	1,09	0,15-8,03	0,929			
41 and over	1,22	0,17-9,01	0,843			
Tuberculosis						
No	Ref.					
Yes	3,92	2,05-7,50	≤0,05	2,64	1,32-5,26	≤0,05
HIV/AIDS						
No	Ref.					
Yes	31,2	14,05-69,27	≤0,05	6,54	1,52-28,18	≤0,05
Hepatitis						
No	Ref.					
Yes	7,95	2,86-22,07	≤0,05	4,01	1,23-13,11	≤0,05
Drug use						
No	Ref.					
Yes	3,51	1,99-6,20	≤0,05	2,44	1,32-4,52	≤0,05
Type of drugs consumed						
Marijuana	Ref.					
Inhalants	3,01	0,39-22,99	0,289			
Cocaine sulphate /cocaine or crack	1,53	0,74-3,16	0,246			
Other types of drugs	15,03	0,01-0,29	0,009			
Inmate's age when drug consumption commenced (years)						
20 and under	Ref.					
Over 21	1,07	0,11-0,92	0,285			
Alcohol consumption						
No	Ref.					
Yes	1,94	0,97-3,88	0,06			
Type of alcohol						
Beer	Ref.					
Chicha (corn liquor)	13,42	5,18-34,75	≤0,05			
Spirits	8,05	2,45-26,49	0,05			
Other types of alcohol	2,14	0,83-5,54	0,117			
Inmate's age when alcohol consumption commenced (years)						
20 and under	Ref.					
Between 21 and 40	0,89	0,27-2,90	0,849			
Over 41	15,63	2,14-114,02	0,007			
Educational level						
No education/initial education	Ref.					
Incomplete/complete primary	1,210	0,11-13,31	0,878			
Incomplete/complete secondary	0,83	0,09-7,95	0,870			

(continued)

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Table 3. Bivariate analysis and multiple regression (*continuation*).

Variables	Bivariate analysis			Multiple regression*		
	PR	CI 95%	*P*	APR	CI 95%	*P*
Sexual orientation						
Heterosexual	Ref.					
Bisexual	7,30	2,59-20,53	≤0,05	1,85	0,51-6,71	0,348
Homosexual	7,15	1,72-29,72	≤0,05	3,41	0,59-19,73	0,171
Relationship with partner						
No stable partner	Ref.					
With stable partner	1,55	0,89-2,69	0,119			
Religion						
Catholic	Ref.					
Other	0,56	0,29-1,10	0,091			
None	0,82	0,21-3,62	0,853			

Note. *Adjusted according to sexual identity, drug consumption, tuberculosis, HIV/AIDS and hepatitis; †CI: confidence interval; ‡P: primary education; §PR: prevalence ratio; ||APR: adjusted prevalence ratio; ¶S: secondary education.
Source: National Institute of Statistics and Information Technology, National Census of the Prison Population of 2016.

of access to health services in prison and the lack of health policies for services and control programmes for STDs. Such a finding should be seen as a serious warning of the need to establish combined control measures for both HIV/AIDS and STDs[17-22].

Viral hepatitis B and C are diseases associated with sexual transmission, with IDU and with transplacental transmission (especially hepatitis B). The survey we used does not discriminate between the types of hepatitis, but a number of studies have come to the same conclusion, in that the presence of hepatitis, especially type B, is found as an independent risk factor in the prison population, especially amongst women[23-25].

In Peru there is no data about intravenous drug use, which aggravates the problem of sexually transmitted and blood-borne diseases, such as hepatitis B and HIV. However, what is noticeable is that the use of inhaled drugs such as those derived from cocaine alkaloid may be significantly associated with STDs, due to reduced psychological barriers, exposure to unprotected sexual behaviours and sex trafficking, which have been observed even in exclusively female prisons. Many studies carried out specifically in countries where IDU (opiates and non-opiates) is widespread in prison settings show that there is an association between drug use and a higher risk of STD transmission, especially in the younger sectors of the prison population, making it an important factor to be borne in mind for public policies to control STD, especially in provisional detention centres[26-29].

Finally, we assessed sexual orientation as a possible factor in presenting STD due to the fact that analysis in the community has not been recognised as an independent factor. However, we believe that, as in other studies, it merits special attention as a part of women's health in controlling STDs, because of the potential inequalities in accessing healthcare services that exist for lesbians, gays, transgender persons and bisexuals (LGTB) in prisons, as is the case in the community[30].

Some limitations of this study are related to problems commonly associated with open database studies: the questions were not specifically designed to study the relationship between the factors and STDs; and the questionnaires were carried out in the prison setting, which may have generated a lack of trust in answering questions that may be regarded as intimate. However, we do feel that we have established some interesting associations for exploration in further studies.

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