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ABSTRACT

Objective: To describe the characteristics of cases of syphilis amongst prison inmates.

Materials and Methods: Descriptive study. Confirmed cases of primary, secondary and early latent syphilis were identified in prisons in Spain during 2007-2008. Socio-demographic and clinical information, as well as variables related to transmission were collected by the attending physicians in a standard questionnaire. Frequency distributions of each variable were performed. Annual incidence rates were calculated. To evaluate the association between qualitative variables, the $\chi 2$ and Fisher's exact tests were used; the Mann-Whitney test was utilized to compare quantitative variables.

Results: During the study period, 94 syphilis cases were identified (35.1% primary, 20.2% secondary and 44.7% early latent). The incidence rates were 0.9 cases/1000 prisoners in 2007 and 0.7 cases/1000 prisoners in 2008. Most cases were male (90.4%), between 31-40 years old (30.9%) and foreigners (52.1%). The majority of patients were diagnosed through screening (80.9%). Heterosexual contact was the most frequent transmission route (83.0%). Overall HIV prevalence was 5.3%, and 16.0% of the patients had a history of previous sexually transmitted infections (STIs). Almost 40% of the cases reported to be a client of a sex worker.

Conclusions: Incidence of syphilis in prison is high. Many syphilis patients were detected through screening, highlighting the role of the Spanish prison health service in STI control.

Key words: syphilis; sexually transmitted infections; HIV; prisons; prisoners; screening; surveillance; public health.

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INTRODUCTION

Syphilis, a sexually transmitted infection (STI) remains a major public health concern today. This is due to its prevalence, to complications caused by late diagnosis and treatment, and to a complex interaction between syphilis and human immunodeficiency infection (HIV): on the one hand, like other ulcerous STIs, syphilis facilitates the transmission of HIV infection[1]; on the other hand, increases in viral load and decreases of CD4 cell counts in HIV infected patients who have contracted syphilis have been described and thus modify the probability of HIV transmission[2].

Until the mid-1990's, the incidence rates of syphilis in Western Europe were low. Since then, many countries have observed an increase in the number of cases, primarily among men who have sex with men (MSM), and later among sex workers and their clients, migrants and among heterosexuals. According to recent data from the European Centre for Disease Prevention [10]and Control, the rate of

reported cases in 2008 in the European Union was 4.1 cases per 100,000 inhabitants, men and those between 25 and 44 years of age were the most affected groups of people[3].

In Spain, epidemiological data from the mandatory disease reporting system show an increase in the number of reported cases of syphilis since 2002, from a rate of 1.9 per 100,000 inhabitants to 5.7 per 100,000 in 2008. This information system collects the number of new syphilis cases at national level in aggregate report forms and has not included so far any characteristics of the infected patients[4].

Different international studies have shown an increased vulnerability of the incarcerated population to STIs[5,6], associated, among other factors, with high-risk sexual behaviours[7]. Figures of syphilis prevalence in prisons vary from 0.5 % in men in France[6] to 6.1 % in Venezuelan prisons; in the United States, prevalence ranges between 1.6 % and 7.5 %[5,9], showing differences between sexes and sexual orientation. In Spain, published works have focused mainly on infection by HIV, and few of them provide information on other STIs; a study carried out in Villabona prison in inmates admitted to the infirmary, prevalence of syphilis was 5.9 %[10]. Notification of syphilis cases in prison, carried out through the mandatory disease reporting system in both aggregate and case-based with minimal data set report forms, collected a median of 57 cases between 2003 and 2007. In 2007 Penitentiary Institutions joined the research project, funded by the Foundation for research and prevention of AIDS in Spain, carried out by the working group on STIs. This group, consisting of 15 specific centres of STI diagnosis and treatment and the National Centre of Epidemiology as the coordinating centre, was created in 2005 with the aim of obtaining extended information regarding syphilis cases in vulnerable populations in order to characterize them, study the co-infection with HIV and analyse the circumstances in which the infection occured[11].

This article aims to describe the characteristics of syphilis cases diagnosed in Spanish prisons between 2007 and 2008.

MATERIAL AND METHOD

Descriptive study of infectious syphilis cases (primary, secondary and early latent) identified in prisons throughout Spain (except for Catalonia, whose competence over penitentiary institutions has been transferred), for the period 2007 and 2008.

Socio-demographic (age, sex, country of birth and education level) and clinical (HIV infection status, STI records, reason for diagnosis) variables were collected for each patient as well as information on the circumstances in which infection took place (transmission route, risk factors for syphilis). Data collection was completed by the prison physicians who diagnosed cases using standard forms; this information was then notified to the Coordination of Prison Health, in charge of the computerization of data in the STI registry which is part of the general registry of mandatory disease reporting system, data cleaning and data analysis. In addition, data were referred anonymously and identified by systematic identification number to the National Centre of Epidemiology where all data from the rest of centres participating in the working group is concurrently analysed.

Frequency distribution for qualitative variables and mean and standard deviation (SD) in age were calculated. To evaluate the association within qualitative variables, chi-square and Fisher tests have been used, as well as the Mann-Whitney U test in order to compare qualitative and quantitative variables. The rate of yearly incidence of syphilis per 1,000 inmates has been obtained, using mean prison population in 2007 (56,523 individuals) and 2008 (60,666 individuals)[12] as indicator. Data were analysed using statistical package IBM SPSS Statistics 18 (SSPS Inc., Chicago, IL, USA).

RESULTS

During the period of study, 94 cases of syphilis (51 in 2007 and 43 in 2008) were identified in 30 prisons. Mean cases per centre over this period was 2 (P_{25} – P_{75}: 1-4) with a range of 1-12. Incidence rates were 0.9 cases/1,000 inmates in 2007 and 0.7 cases/1,000 inmates in 2008.

The socio-demographic characteristics of patients are shown in Table 1. Most cases were men (male/female ratio: 9.4) with low level of studies. Mean age at diagnosis was 37.8 years (SD: 10.7 years), no sex differences. More than half of patients came from foreign countries, mainly from Eastern Europe and Latin America. Mean age of Spanish patients was higher than that of foreigners (42.0 years (SD: 10.7) in comparison with 33.9 years (SD: 9.1 years) ($p<0.05$).

According to medical status, nearly 45 % of the cases presented an early latent syphilis, in comparison with 35.1% of primary syphilis and 20.2 % secondary syphilis. Regardless of the stage of infection, the majority of cases were diagnosed through screening (Table 2).

Variables	n	%
Sex		
Men	85	90.4
Women	9	9.6
Age		
<_ 20 years	3	3.2
21-30	24	25.5
31-40	29	30.9
41-50	27	28.7
>50	11	11.7
Level of studies		
No studies	2	2.1
Primary	45	47.9
Secondary	18	19.1
Superior	1	1.1
Information not provided	28	29.8
Place of birth		
Spain	45	47.9
Western Europe	3	3.2
Eastern Europe	20	21.3
Latin America	15	16.0
Sub-Saharan Africa	1	1.1
North Africa	8	8.5
Others	2	2.1
Total	94	100

Table 1. Distribution of cases of syphilis in prison according to socio-demographic characteristics.

Regarding personal records, 16.0 % of cases reported to have previously had some STIs, and 5 patients were co-infected with HIV before the diagnosis of syphilis and already knew; of which, 4 were men and all of them were Spanish. The most common transmission route was non-protected heterosexual relations (83.0%) and 7 men reported sexual relations with other men (2 homosexuals and 5 bisexuals) (Table 3). There were no differences in the transmission route according to place of origin. The prevalence of HIV in patients who contracted syphilis through heterosexual relations was 3.8 % (2.9 % in men and 11.1 % in women) and 14.3 % in men having sexual relations with other men (MSM).

When we analysed the most probable risk factors for syphilis, being clients of sex workers followed by sexual relation with occasional partners were the most common. All the cases who had sex with a sex worker were men and 54.1 % were foreigners. 8.5 % of cases of syphilis were sex workers (4 men and 4 women); the percentage of women who considered prostitution a main causal factor in contracting syphilis compared to the total number of infected women was 44.4 % whereas that of men was 4.7 %, although these differences did not achieve statistical significance. One third of patients reported to have had between 1 and 2 sex partners over the past twelve months, even though this information is not known in more than half of the cases (Table 3).

DISCUSSION

This article presents a detailed description of the epidemiological, clinical characteristics as well as those related to transmission of syphilis in cases diagnosed in Spanish prisons over a period of 2 years.

The incidence rate of syphilis in Spanish prisons in 2008 was 12 times higher than in the general population that same year[4]. Although the prison population have undergone screening, thus rates are not comparable, these figures give an idea of the concentration of vulnerable population to this pathology in prisons and underline the need to continue with programs for the promotion of sexual health in this

Reason for diagnosis	Primary syphilis		Secondary syphilis		Early latent syphilis		Total	
	n	%	n	%	n	%	n	%
Clinical manifestations	2	6,1	1	5,3	–	–	3 3,2	
Screening	22	66,7	18	94,7	36	85,7	76 80,9	
Contact Investigation	1	3,0	0	0,0	0	0,0	1 1,1	
Information not provided	8	24,2	0	0,0	6	14,3	14 14,9	
Total	33	100	19	100	42	100	94 100	

Table 2. Distribution of cases of syphilis in prison according to reason for diagnosis and medical status.

Variables	n	%
HIV infection status		
HIV+	5	5,3
HIV -	87	92,6
Information not provided	2	2,1
Mecanismo de transmisión		
Heterosexual Relations	78	83,0
Sexual relations between men	7	7,4
Information not provided	9	9,6
Risk factors for syphilis		
Client of a sex worker	37	39,4
Occasional partner	22	23,4
Stable partner	10	10,6
Stable + occasional partner	5	5,3
Prostitution	8	8,5
Information not provided	12	12,8
Estimate Nº of partners over the past 12 months		
1-2	30	31,9
3-5	9	9,6
6-10	3	3,2
Over	2	2,1
Information not provided	50	53,2
Total	94	100

Table 3. Distribution of cases of syphilis in prison according to clinical characteristics and those related to transmission.

setting. Nevertheless, incidence rates for syphilis in prisons in 2008 have decreased to values similar to those obtained in 2003[13], unlike what happens in the general population, where the reported syphilis rates have been increasing since the beginning of the 2000's[4].

According to the results of this study, men, individuals with low level of studies and foreigners are the most affected sub-groups. This pattern does not differ from the general characteristics of the prison population. Despite a clear prevalence of men, the men ratio (9 men per woman) in our study is lower to that of the prison population (11 men per woman)[12]. The lowest man/woman ratio observed in our study may be related to the profession of the women with syphilis before their incarceration, who reported to be sex workers in a very high percentage.

45 % of cases of syphilis were diagnosed at latent stage, more than that found in STI centres for this period (38 %); this data suggest a delay in the diagnosis of syphilis in this population in which symptomatic stages have not been detected. Although this assumption is beyond the scope of study and has not been verified, it is known that inmates often come from sectors of social exclusion and that many of them have had little contact with the health services before their incarceration[14]. The majority of cases have been diagnosed through screening. This is due to the fact that screening of syphilis, together with HIV and hepatitis, is offered to all inmates upon entering prison. This clinical practice is part of the program for the prevention and control of communicable diseases via injecting drug use and sexual relations implemented in the 1980's, whose level of acceptance is approximately 80 %[15], unlike other countries where this figure does not reach 50 %[16].

The main transmission route for syphilis was non- protected heterosexual relations. These figures contrast with those found in the working group on STIs, in which 68 % of cases of syphilis occurred amonsgt MSM[11]. Unfortunately, this information is not provided at population level, thus we cannot compare this data with what happens in the general population.

Although many cases reported to have a history of STIs, the percentage is lower than the 31 % detected in men with STIs in a French prison[6].

5.3 % presented co-infection with HIV, similar to the figures found in heterosexual men diagnosed in STI centres[11], but lower than the prevalence of reported HIV in the general prison population in 2008 (7.8%)[15]; this aspect could be related to voluntary screening if the prevalence of co-infection HIV/syphilis were higher among individuals who reject testing and those who accept, although this cannot be verified since no information regarding patients who reject screening is available. Another explanation could be that there is a greater proportion of foreigners among inmates with syphilis than among the general prison population (41.9 % compared to 34.6 % in 2008)[17], and that there are less injecting drug users among foreign inmates compared to Spanish inmates (2.2% compared to 16 %) so the likelihood of HIV infection is lower among foreigners[18].

A high prevalence of syphilis/HIV co-infection among heterosexual women and MSM has been identified in this study. However it is difficult to evaluate this finding due to the low number of individuals in these two sub-groups amongst the prison population infected with syphilis. The proportion of men

who reported being clients of sex workers as a cause of infection is higher, with 26 %, to that found in heterosexual men in STI centres[19]. Among women, although the size of the sample makes any comparison difficult, the proportion who reported to be sex workers is lower, with 60 %, than that found in women with syphilis diagnosed in STI centres[19] outside prison.

This study presents some limitations. Since the screening upon entry to prison is voluntary, and despite the fact that the acceptance rate is very high, syphilis diagnoses may be underestimated. On the other hand, the low number of cases, makes the detection of significant differences between groups difficult, even in the hypothetical situation that those cases existed. The detection and treatment of syphilis in penitentiary institutions has undoubted benefits to the patients' health as well as from the point of view of public health, since transmission among inmates (of which cases have been documented[20]) and between inmates and the population outside prison has been limited.

Thus, the role of the prison health services is fundamental for the diagnosis, treatment and prevention of STIs in a high-risk population which is difficult to reach outside prison[21].

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