HIV/STI co-infection among men who have sex with men in Spain

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This article was published on 9 December 2009.
Citation style for this article: Diaz A, Junquera ML, Esteban V, Martínez B, Pueyo I, Suárez J, Ureña JM, Varela JA, Vall M, del Romero J, Sanz I, Belda J, Boronat J, Gómez P, Gual F, Colomo C, López de Munain J, Balaguer J, Landa MC, Lezaun ME, Cámara MC, Fernández E, Bru FJ, Alastrue I, Ordoñana JR, de Armas C, Azpiri MA, Gomez L, Trullén J, Diez M, on behalf of STI Study Group and EPI-VIH Group. HIV/STI co-infection among men who have sex with men in Spain. Euro Surveill. 2009;14(48):pii=19426. Available online: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19426

In Spain, neither the HIV nor the STI national surveillance system collects information on HIV/STI co-infection. However, there are two networks based on HIV/STI clinics which gather this data. We describe HIV prevalence in men who have sex with men (MSM) diagnosed with infectious syphilis and/or gonorrhoea in 15 STI clinics; and concurrent diagnoses of STI in MSM newly diagnosed with HIV in 19 HIV/STI clinics. In total, 572 MSM were diagnosed with infectious syphilis and 580 with gonorrhoea during 2005-2007. HIV prevalence among syphilis and gonorrhoea cases was 29.8% and 15.2% respectively. In the multivariate analysis, HIV/syphilis co-infection was associated with being Latin American; having a history of STI; reporting exclusively anal intercourse; and having sex with casual or several types of partners. HIV and gonorrhoea co-infection was associated with age older than 45 years; having no education or only primary education completed; and having a history of STI. In total, 1,462 HIV infections were newly diagnosed among MSM during 2003-2007. Of these, 31.% were diagnosed with other STI at the same time. Factors associated with STI co-infection among new HIV cases in MSM were being Latin American; and having sex with casual partners or with both steady and casual partners. In Spain, a considerable proportion of MSM are co-infected with HIV and STI.

Introduction

HIV infection continues to disproportionately affect men who have sex with men (MSM) in the European Union [1], and many countries have reported an increase of the number of new HIV diagnoses in MSM since the early 2000s [2,3]. At the same time,

sexually transmitted infections (STI) have also re-emerged in this group [4] and the occurrence of several outbreaks mainly involving HIV-infected MSM [5], underlies the extent of HIV and other STI co-infections in this population. It is known that the presence of other STI may increase the likelihood of transmitting or contracting HIV [6].

While information on new HIV diagnoses is not yet available on a national basis in Spain, data collected in eight autonomous regions, covering 32% of the total Spanish population, show that the number of MSM newly diagnosed with HIV has been increasing among Spaniards as well as foreign-born population (Figure) [7]. Furthermore, nationwide surveillance data on gonorrhoea and syphilis show an increase in the number of reported cases of both diseases since 2002 [8], and syphilis outbreaks affecting MSM have been reported recently [9]. Unfortunately, at the moment, neither the HIV nor the STI national surveillance systems collect information on co-infection.

However, in addition to population surveillance systems, in Spain there are two networks that collect detailed data on new HIV, syphilis and gonorrhoea diagnoses, including information on HIV/STI co-infection. These networks are based on HIV/STI clinics which are very low-threshold public facilities, where barriers to access are minimised and medical consultation for HIV and STI is free of charge.

This report presents data coming from both networks and examines HIV/STI co-infection in MSM with the following aims:

a) To describe HIV prevalence and factors associated with HIV co-infection in MSM diagnosed with infectious syphilis and/or gonorrhoea in 15 STI clinics (STI Study Group)

b) To describe concurrent diagnoses of STI and factors associated with STI co-infection in MSM newly diagnosed with HIV in 19 HIV/STI clinics (EPI-VIH Group)

Methods

HIV prevalence among MSM with infectious syphilis and/or gonorrhoea

All infectious syphilis (primary, secondary and early latent) and/or gonorrhoea patients prospectively identified between July 2005 and December 2007 by the STI Study Group were included in this study. The Group is a network of 15 STI clinics located in 14 of the most populated Spanish cities: Madrid, Barcelona, Seville, Malaga, Bilbao (two clinics), Granada, Algeciras, Oviedo, Gijon, San Sebastian, Tarragona, Cartagena, Murcia and Alicante. Data from the Prison Health Service were incorporated since January 2007. These clinics have a long tradition of attending STI patients belonging to core at-risk populations (sex workers and their clients, migrants, MSM and heterosexuals with high-risk sexual behaviours). Participation is voluntary but, to our knowledge, all but one of this type of clinic in Spain belong to this network.

Cases included in this analysis were identified using the corresponding European case definitions [10].

Data on the patients´ socio-demographic (age, sex, country of birth, educational level) and clinical variables (HIV status, history of previous STI, transmission route), as well as information on the circumstances of infection, were collected in a standard questionnaire by the attending physicians, the majority of whom are STI specialists.

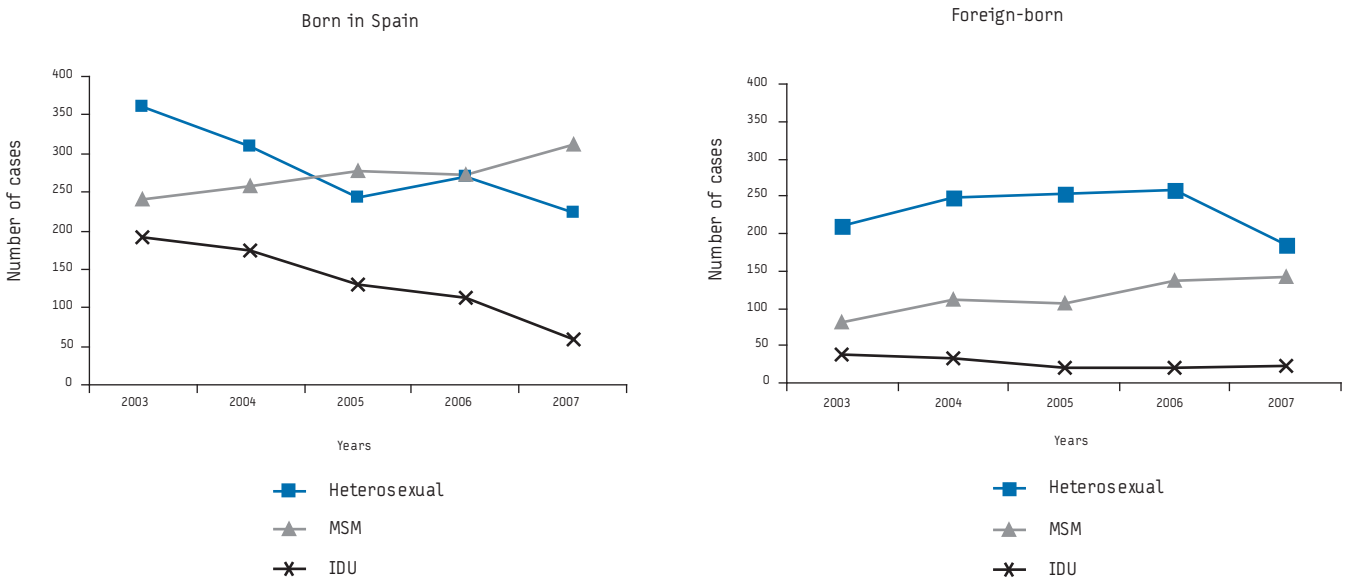
The study was performed according to the requirements of the Spanish legislation on data protection. No personal identifiers were collected.

Concurrent diagnosis of STI among HIV infections newly diagnosed in MSM

All MSM newly diagnosed with HIV between 2003 and 2007 by the EPI-VIH Group were prospectively identified and included in this study. The EPI-VIH Group is a network of HIV and STI clinics

Figure

Newly diagnosed HIV infections, by country of birth and transmission mode, Spain (eight autonomous regions), 2003-2007



MSM: Men who have sex with men; IDU: Intravenous drug user

located in 18 Spanish cities: Madrid (two clinics), Barcelona, Seville, Bilbao, Granada, Oviedo, Gijon, San Sebastian, Vitoria, Logroño, Pamplona, Cartagena, Murcia, Alicante, Castellón, Valencia, Santa Cruz de Tenerife, Santander. Ten of these clinics are also included in the STI Study Group; the rest are clinics specialised in HIV diagnosis that mostly serve HIV-vulnerable populations. Participation is voluntary, but more than 90% of the STI/HIV clinics in Spain belong to this network.

Table 1

HIV prevalence in syphilis and gonorrhoea cases in men who have sex with men (MSM), by different variables, Spain, 2005-2007

Variables	Syphilis cases			Gonorrhoea cases		
	Total number of cases	HIV prevalence n (%)	p*	Total number of cases	HIV prevalence n (%)	p*
Age groups (years)						
< 25	52	9 (17.3)		91	7 (7.7)	
25-34	210	56 (26.7)		207	28 (13.5)	
35-44	177	65 (36.7)	0.05	120	24 (20.0)	0.01
≥45	67	22 (32.8)		37	11 (29.7)	
Unknown	10	2 (20.0)		7	0 (0.0)	
Educational level						
Illiteracy/Primary education	115	29 (25.2)		68	16 (23.5)	
Secondary/University education	323	100 (31.0)	0.47	310	41 (13.2)	0.10
Unknown	78	25 (32.1)		84	13 (15.5)	
Region of birth						
Spain	399	110 (27.6)		377	52 (13.8)	
Western Europe	27	9 (33.3)		22	2 (9.1)	
Eastern Europe	3	0 (0.0)	0.09	3	0 (0.0)	0.05
Latin America	80	33 (41.2)		52	13 (25.0)	
North Africa	3	0 (0.0)		3	2 (66.7)	
Other/Unknown	4	2 (50.0)		5	1 (20.0)	
Previous STI						
Yes	178	68 (38.2)		212	42 (19.8)	
No	166	21 (12.6)	0.00	166	5 (3.0)	0.00
Unknown	172	65 (37.8)		84	23 (27.4)	
Sexual practices						
Only oral intercourse	106	35 (33.0)		125	20 (16.0)	
Only anal intercourse	21	10 (47.6)	0.00	44	6 (13.6)	0.01
Oral and anal intercourse	182	32 (17.6)		192	19 (9.9)	
Unknown	207	77 (37.2)		101	25 (24.7)	
Type of partners						
Sexual contact with a steady partner (solely)	33	2 (6.1)		59	3 (5.1)	
Sexual contact with a casual partner (solely)	189	55 (29.1)		230	30 (13.0)	
Sexual contact with a steady and casual partner	85	18 (21.2)		65	4 (6.1)	
Exchange of sex for drugs or money	14	3 (21.4)	0.01	11	5 (45.4)	0.00
Mixed**	26	11 (42.3)		24	8 (33.3)	
Unknown	169	65 (38.5)		73	20 (27.4)	
Number of sexual partners in the last 12 months						
1-2	61	12 (19.7)		74	6 (8.1)	
3-10	127	24 (18.9)		136	14 (10.3)	
≥11	126	36 (28.6)	0.00	141	22 (15.6)	0.00
Unknown	202	82 (40.6)		111	28 (25.2)	
TOTAL* **	**516**	**154 (29.8)**		**462**	**70 (15.2)**	

*Chi-squared or Fisher's test
**Mixed: sexual contact with different partners (casual, steady, exchange of sex for drugs or money)
***56 syphilis and 118 gonorrhoea cases were excluded from the table because their HIV status was unknown

Cases included in this analysis met the European case definition for new HIV diagnosis [10].

Epidemiological variables (age, sex, country of birth, educational level), clinical information (transmission route, history of previous and concomitant STI) and circumstances of the infection were collected by the attending physicians using a standardised questionnaire.

The study was performed according to the requirements of the Spanish legislation on data protection. No personal identifiers were collected.

Frequency distributions for each variable and prevalence of HIV/STI co-infection, global and stratified by different variables were calculated. To evaluate the association between qualitative variables, the chi-squared and Fisher's exact tests were used. Logistic regression models were fitted, following Hosmer and Lemeshow model-building strategies [11], to identify: a) factors associated with HIV co-infection among MSM with infectious syphilis or gonorrhoea; b) concomitant STI co-infection among newly HIV diagnosed MSM. Associations were measured using the odds ratio (OR) and its 95% confidence interval (95% CI). Data analyses were performed using the STATA statistical software package Version 10.0 [12].

Results

HIV prevalence among MSM with infectious syphilis and/or gonorrhoea

A total of 1,152 MSM with infectious syphilis and/or gonorrhoea were identified during the study period: 572 were diagnosed with

Table 2

Factors associated with HIV co-infection among men who have sex with men (MSM) diagnosed with syphilis or gonorrhoea, Spain, 2005-2007

Variables	HIV and syphilis co-infection		HIV and gonorrhoea co-infection	
	Adjusted OR	95% CI	Adjusted OR	95% CI
Age groups (25-34 years)				
< 25	0.8	(0.3-2.1)	0.6	(0.2-1.5)
35-44	1.6	(0.9-2.6)	1.4	(0.7-2.8)
≥45	1.5	(0.7-3.0)	3.4	(1.3-9.0)
Educational level (secondary/university education)				
Illiteracy/Primary education	0.8	(0.4-1.4)	3.4	(1.5-7.5)
Unknown	0.5	(0.2-1.1)	1.4	(0.5-3.6)
Region of birth (Spain)				
Western Europe	1.0	(0.4-2.5)	0.3	(0.1-1.5)
East Europe	-	-	-	-
Latin America	2.2	(1.2-4.0)	1.2	(0.4-3.0)
North Africa	-	-	4.3	(0.3-69.1)
Other/Unknown	4.1	(0.4-38.0)	0.8	(0.1-8.8)
Year of diagnosis (2006)				
2005	0.8	(0.4-1.4)	0.6	(0.3-1.5)
2007	1.8	(1.1-3.1)	1.2	(0.6-2.3)
Previous STI (No)				
Yes	4.3	(2.2-8.5)	6.0	(2.1-16.9)
Sexual practices (oral and anal intercourse)				
Only anal intercourse	5.5	(1.6-19.1)	1.5	(0.4-5.3)
Only oral intercourse	1.8	(0.9-3.5)	1.6	(0.7-3.6)
Type of partners (sexual contact with a steady partner only)				
Sexual contact with a casual partner (solely)	6.8	(1.3-36.0)	1.7	(0.4-7.4)
Sexual contact with a steady and casual partner	3.7	(0.7-21.1)	0.6	(0.1-3.4)
Exchange of sex for drugs or money	4.8	(0.4-62.2)	18.4	(0.9-363.7)
Mixed**	14.0	(2.1-91.7)	4.5	(0.8-25.6)
Unknown	6.8	(0.7-64.9)	8.4	(0.4-197.6)
Number of sexual partners in the last 12 months (1-2 partners)				
3-10	0.5	(0.2-1.2)	1.6	(0.4-5.9)
≥11	0.8	(0.3-2.0)	1.4	(0.4-4.9)
Unknown	2.1	(0.6-7.7)	2.3	(0.4-14.4)

*Reference categories in brackets; models adjusted by clinic of diagnosis
** Mixed: sexual contact with different partners (casual, steady, exchange of sex for drugs or money)
OR: odds ratio; CI: confidence interval

syphilis (215 primary, 265 secondary and 92 early latent) and 580 with gonorrhoea.

The mean age for syphilis patients was 35 years (SD: 9.2), (range 16-77 years), and the most affected age group was 25-34 years (40.7%). The majority (63.6%) had completed secondary/university education and almost a quarter (132 cases) were born outside Spain, mainly in Latin America and Western Europe.

Nearly one third of the cases (183, 32.0%) had a history of previous STI, and 97 (17.0%) had other STI concurrently diagnosed: 28 chlamydia, 24 genital warts, 22 gonorrhoea, 18 herpes simplex virus infection and five other STI.

Information on sexual practices considered to be the cause of the current syphilis episode was available for 321 (56.1%) cases. Of these, 108 (33.6%) reported exclusively oral sex, 24 (7.5%) had anal intercourse solely, whereas 189 (58.9%) recalled both. Regarding type of sexual partner thought to be the source of infection, data were available in 359 (62.7%) cases. Of these, 195 (54.3%) had sex with a casual partner solely; 36 (10.0%) with their steady partner only; 87 (24.2%) reported sex with both casual and steady partners; in nine cases (2.5%) the infection was attributed to being a sex worker; in five (1.4%) to being a client of a sex worker; and 27 patients reported a combination of the above categories.

Information on HIV status was available for a total of 516 (90.2%) syphilis cases. Of these, 154 (29.8%) were co-infected with HIV and the majority (125 cases) were aware of their infection. HIV co-infection was more likely in those with higher number of sexual partners in the last year; those with prior history of STI; those having sex with casual partners and those who reported anal intercourse as the most likely transmission mode for the syphilis episode (Table 1).

In the multivariate analysis, the probability of being co-infected with HIV and syphilis was higher among Latin Americans (OR: 2.2; 95% CI: 1.2-4.0), men with a history of previous STI (OR:4.3;

Table 3

STI co-infections in men who have sex with men (MSM) newly diagnosed with HIV, by different variables, Spain, 2003-2007

Variables	Total number of cases	STI and HIV co-infection	p*
	n	n, prevalence (%)	
Age groups (years)			
< 25	161	53 (32.9)	
25-34	712	222 (31.2)	0.54
35-44	407	121 (29.7)	
>=45	108	29 (26.8)	
Unknown	74	28 (37.8)	
Educational level			
Illiteracy/Primary education	228	76 (33.3)	
Secondary/University education	1078	325 (30.1)	0.51
Unknown	156	52 (33.3)	
Region of birth			
Spain	909	259 (28.5)	
Western Europe	55	20 (36.4)	
East Europe	19	7 (36.8)	0.04
Latin America	450	162 (36.0)	
Sub-Saharan Africa	6	1 (16.7)	
Other/Unknown	23	4 (17.4)	
Previous STI			
Yes	720	231 (32.1)	
No	658	196 (29.8)	0.65
Unknown	84	26 (31.0)	
Type of partners			
Sexual contact with a steady partner (solely)	175	42 (24.0)	
Sexual contact with a casual partner (solely)	695	223 (32.1)	
Sexual contact with a steady and casual partner	199	75 (37.7)	0.06
Exchange of sex for drugs or money	33	7 (21.2)	
Mixed**	309	91 (29.5)	
Unknown	51	15 (29.4)	
TOTAL	**1462**	**453 (31.0)**	

*Chi squared or Fisher's test
**Mixed: sexual contact with different partners (casual partner, steady partner, exchange of sex for drugs or money)

95% CI: 2.2-8.5), those reporting anal intercourse solely (OR: 5.5; 95% CI:1.6-19.1) and those having sex with casual (OR: 6.8; 95% CI:1.3-36.0) or several types of partners (OR:14.0; 95% CI:2.1-91.7) (Table 2).

In total, 580 MSM were diagnosed with gonorrhoea during the study period. Mean age at diagnosis was 32 years (SD: 8.3), (range 16-65) years, and the age group most affected was 25-34 years (44.1%). Almost 69% of the cases had completed secondary/university education and 121 (20.9%) were born in countries other than Spain, mostly in Latin America and Western Europe.

History of previous STI was very common (38.8% of the cases), and 132 (22.8%) gonorrhoea cases were concurrently diagnosed with other STI: 67 with chlamydia, 24 with genital warts, 22 with syphilis, 18 with herpes virus and 13 with other STI.

Gonorrhoea transmission was attributed to exclusively oral sex in 51 cases (12.8%), solely anal intercourse in 136 (34.1%) and to both oral sex and anal intercourse in 212 (53.1%); for 181 cases (31.2% of the total) this information was not available.

Regarding the category of sexual partner considered to be the possible source of infection, this information was available for 430 (74.1%) gonorrhoea cases. Of these, 256 (59.5%) attributed the infection to sex with casual partner only, 73 (17.0%) to sex with both casual and steady partners, 66 (15.3%) to sexual contact with their steady partner only, 10 (2.3%) to sexual contact with clients (sex work), and 25 (5.9%) to contact with several types of sexual partners.

Of the 462 (79.6%) gonorrhoea cases with data on HIV infection, 70 (15.2%) were co-infected and the majority of these (59 cases) had been aware of their HIV status. HIV prevalence increased with age and with number of sexual partners in the last 12 months; it was also higher in men with a history of previous STI, those recalling only oral sex as the practice most likely to be the cause of this gonorrhoea episode, and those who exchanged sex for drugs or money (Table 1).

In the multivariate analysis, HIV and gonorrhoea co-infection among MSM was associated with age older than 45 years (OR: 3.4; 95% CI: 1.3-9.0), having no education or only primary education

Table 4

Factors associated with STI co-infection in men who have sex with men (MSM) newly diagnosed with HIV, Spain, 2003-2007

Variables	STI and HIV co-infection	
	Adjusted OR	95% CI
Age groups (25-34 years)		
< 25	1.1	(0.7-1.6)
35-44	1.0	(0.7-1.3)
≥45	0.8	(0.5-1.3)
Educational level (Secondary/University education)		
Illiteracy/Primary education	1.2	(0.9-1.7)
Unknown	0.7	(0.5-1.1)
Region of birth (Spain)		
Western Europe	1.4	(0.8-2.5)
East Europe	2.2	(0.8-6.0)
Latin America	1.5	(1.2-2.0)
Sub-Saharan Africa	0.5	(0.1-4.7)
Other/Unknown	0.5	(0.2-1.7)
Year of diagnosis (2003)		
2004	1.3	(0.8-2.0)
2005	1.0	(0.6-1.5)
2006	1.5	(1.0-2.2)
2007	1.2	(0.8-1.7)
Previous STI (No)		
Yes	1.0	(0.7-1.2)
Type of partners (sexual contact with a steady partner only)		
Sexual contact with a casual partner (solely)	1.5	(1.0-2.3)
Sexual contact with a steady and casual partner	1.9	(1.2-3.2)
Exchange of sex for drugs or money	1.0	(0.4-2.7)
Mixed**	1.2	(0.8-1.9)
Unknown	1.2	(0.6-2.5)

*Reference categories in brackets; model adjusted by clinic of diagnosis
**Mixed: sexual contact with different partners (casual partner, steady partner, exchange of sex for drugs or money)
OR: odds ratio; CI: confidence interva

completed (OR: 3.4; 95% CI: 1.5-7.5), and having a history of STI (OR: 6.0; 95% CI: 2.1-16.9) (Table 2).

Concurrent diagnosis of STI among HIV infections newly diagnosed in MSM

In total, 1,462 HIV infections were newly diagnosed among MSM during the period 2003-2007. The majority (62.2%) were Spanish, mean age at diagnosis was 32.8 years (SD: 7.6) and almost two thirds (73.7%) had secondary/university education completed. Patients attributed their HIV infection to sexual contact with a casual partner in 695 (47.5%) cases, sex with their steady partner in 175 (12.0%), sexual contact with casual and steady partners in 199 (13.6%), exchanging sex for drugs or money in 33 (2.3%), and different combinations of the previous categories in 309 cases (21.1%). In 51 cases (3.5%) this information was not available.

History of previous STI was very common among the newly diagnosed HIV cases in MSM (49.2%). A total of 453 (31.0%) men were concurrently diagnosed with other STI at the time of HIV diagnosis. The most frequent infections diagnosed were: syphilis (223 cases), genital warts (92) and gonorrhoea (56). Concurrent STI and HIV co-infection was higher among those in the age-group 25-34 years and among Latin American men (Table 3).

In the multivariate analysis, factors associated with STI co-infection among newly diagnosed HIV cases in MSM were: being Latin American (OR: 1.5; 95% CI: 1.2-2.0), having sex with casual partners (OR: 1.5; 95%CI: 1.0-2.3) or with both steady and casual partners (OR: 1.9; 95%CI: 1.2-3.2) (Table 4).

Discussion

In this article data from Spain on HIV prevalence among MSM with syphilis and/or gonorrhoea, and concurrent STI diagnoses in MSM newly diagnosed with HIV are presented. Data were collected in clinics specialising in STI and/or HIV diagnosis. While results cannot be extrapolated to all MSM in the country, they provide valuable information on STI/HIV co-infections among MSM with risk behaviours for HIV and other STI resident in medium and big Spanish cities. This information is even more valuable because, to date, neither the HIV nor the STI national surveillance systems have collected information about HIV/STI co-infection.

HIV prevalence among MSM with syphilis in Spain is 29.8%. This figure is intermediate and within the range of 14%-59% found in different European countries [13]. Regarding HIV prevalence among MSM with gonorrhoea (15.2%), it is lower than the 32% reported in the United Kingdom in 2008 [2] or the 19% reported in New York City for 1990-1997 [14], but higher than the 11% found in a Stockholm STI clinic in 2004 [15].

Most of the syphilis and gonorrhoea cases co-infected with HIV were aware of their status. This finding, common to other studies [13,16,17], shows that some HIV-positive MSM continue to pursue risky behaviours even if they are aware of their HIV status, thus contributing to HIV transmission and putting themselves at risk of re-infection with HIV or infection with another STI.

Almost one third of MSM newly diagnosed with HIV during the period 2003-2007 were concurrently diagnosed with other STI, most commonly syphilis (15% prevalence). Similar results were found in a cohort of HIV-infected MSM in Sidney, where prevalence of syphilis among HIV-positive MSM was 19% (compared to 3.0% among HIV-negative MSM) [18]; whereas an even higher prevalence, 44.4%, was found among newly diagnosed HIV-infected MSM in a San Francisco STI clinic, in spite of the fact that only gonorrhoea and chlamydia infections were considered in this study [19].

Being born in Latin America was associated with both high HIV prevalence in syphilis and gonorrhoea patients and high STI prevalence in newly diagnosed HIV patients. This finding is consistent with what has been found in other studies in Spain [20] and shows that this MSM population is particularly vulnerable to HIV and other STI infections. Reasons for this are unclear. Latin Americans speak Spanish and, in theory, should have fewer problems to adapt to Spain. On the other hand, data from the EPI-VIH study show that a high percent of sex workers are Latin American [21,22]. Besides, it has been suggested that some HIV-positive Latin-American MSM might have migrated to Spain in search of a more socially-friendly environment.

Having sex with casual partners or having "mixed sexual contacts" (i.e. "casual partners + sex clients", "casual partners + contact with a sex worker" etc.) was also associated with HIV and syphilis co-infection. This result has been found also in other studies [17,23] and it is not surprising since in these situations people are less likely to know their partner's HIV status.

Although in this and in other studies [24,25] history of previous STI has been associated with higher HIV prevalence, both in syphilis and gonorrhoea cases, other factors associated with HIV and gonorrhoea co-infection differ clearly from those related to HIV and syphilis co-infection. Thus, among MSM with gonorrhoea, we found that HIV infection was more likely among men older than 45 years, those with low educational level and sex workers, variables that did not appear so relevant in MSM with HIV and syphilis co-infection. Further studies are needed to confirm these differences and provide insight into the possible reasons behind these differences.

Data presented in this paper show that there is a great degree of overlap among HIV and other STI among MSM in Spain. Implications of this finding are several: a) further studies are needed to better understand the epidemiology of HIV/STI co-infection in MSM; b) HIV-positive MSM should be a priority for HIV and STI prevention programmes; c) Latin American MSM should be a priority for prevention; d) in addition to HIV testing being included in the STI diagnostic process, the presence of other STI should be assessed in MSM newly diagnosed with HIV.

Financial support

This work was funded by two grants (36646/07; 36794/08) from the Foundation for Research and Prevention of AIDS in Spain (Fundación para la Investigación y la Prevención del SIDA en España–FIPSE).

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