Actas Dermosifiliogr. 2010;**101(10)**:847–852

ACTAS
Dermo-Sifiliográficas

Full English text available at
www.elsevier.es/ad

ORIGINAL ARTICLE

Condom Use and Number of Sexual Partners among Male Syphilis Patients who Report Having Sex with Men

B. Repiso,[a,*] M. Frieyro,[a] F. Rivas-Ruiz,[b] M. De Troya[a]

[a]*Servicio de Dermatología, Empresa Pública Hospital Costa del Sol, Marbella, Málaga, Spain*
[b]*Unidad de Investigación, Empresa Pública Hospital Costa del Sol, Marbella, Málaga, Spain*

Manuscript received February 3, 2010; accepted for publication June 10, 2010

KEYWORDS
Syphilis;
Homosexuality;
Sexual partners;
Male condoms

Abstract
Background and objectives: Recent years have seen a resurgence of syphilis in Spain due to changes in sexual behavior. Here we describe the incidence of the disease in our clinic and investigate its relationship with the sexual habits of men who have sex with men (MSM).
Patients and methods: A cross-sectional descriptive study of incident cases of syphilis in 2007 and 2008 was performed, followed by a case–control study of sexual behavior in the previous year to compare MSM with and without syphilis.
Results: We recorded 26 new cases of syphilis, 19 of which were diagnosed at early stages. Eight patients were infected with human immunodeficiency virus and 15 were classed as MSM. Sixty-five MSM without syphilis were selected as a control group. MSM with syphilis had a larger number of sexual partners: odds ratio (OR), 3.98 (95% confidence interval [CI], 0.90–17.46) for the category "2 to 5 sexual partners"; OR, 3.22 (95% CI, 0.84–12.43) for the category "more than 5 sexual partners". The inconsistent use of condoms was significantly more common among MSM with syphilis than among those without syphilis (OR, 3.96; 95% CI, 1.15–13.61; *P*=.02).
Conclusions: Syphilis continues to be a public health problem in our setting, particularly among homosexual and bisexual men. In this study, inconsistent use of condoms and a greater number of sexual partners were risk factors for syphilis in MSM. The development of prevention programs targeting this at-risk population should be considered a priority.

*Corresponding author.
E-mail address: Brepiso@aedv.es (B. Repiso).

0001-7310/$ - see front matter

PALABRAS CLAVE
Sífilis;
Homosexualidad;
Parejas sexuales;
Preservativo masculino

Uso de preservativo y número de parejas sexuales en hombres que tienen sexo con hombres con sífilis

Resumen

Introducción y objetivos: La sífilis ha aumentado en España en los últimos años, debido a cambios en los hábitos sexuales. Describimos la incidencia de sífilis en nuestra consulta y estudiamos los hábitos sexuales de los hombres que tienen sexo con otros hombres (HSH).

Pacientes y métodos: Estudio transversal descriptivo de los casos incidentes de sífilis en los años 2007 y 2008, y estudio caso-control de los hábitos sexuales en el último año de los HSH diagnosticados o no de sífilis.

Resultados: Registramos 26 nuevos casos de sífilis, 19 de ellos en el estadio de sífilis precoz. 8 pacientes estaban infectados por el virus de la inmunodeficiencia humana y 15 eran HSH. Como grupo control se seleccionaron 65 HSH sin sífilis. Demostramos un mayor número de parejas sexuales en los HSH afectos de sífilis, 3,98 (IC 95% = 0,90–17,46) veces más en la categoría «entre 2 y 5 parejas» y 3,22 (IC 95% = 0,84–12,43) en la categoría de «más de 5 parejas». En el apartado de uso de preservativo estas diferencias fueron significativas (p = 0,02), siendo 3,96 veces superior (IC 95% = 1,15–13,61) el empleo inconstante del mismo en el grupo de HSH con sífilis.

Conclusiones: La sífilis continúa siendo un problema de salud pública en nuestro medio, particularmente entre homo y bisexuales. El inconstante uso de preservativo y un mayor número de parejas sexuales son factores de riesgo de sífilis en los HSH de nuestra serie. Es prioritario desarrollar programas de prevención dirigidos a la población de riesgo.

Introduction

The incidence of syphilis in Spain has increased annually since the turn of the 21st century. The number of new cases reported increased from 2.57 per 100 000 population in 1995 to 4.31 in 2006, placing syphilis ahead of gonorrhea in the national ranking of sexually transmitted diseases (STDs).[1] A similar increase in incidence was also detected in the province of Malaga, where the number of cases reported to the Andalusian epidemiology surveillance system rose from 19 in 2003 to 90 in 2007; 37 of the cases were reported in the health care area of Costa del Sol Occidental.[2] Small epidemics are not uncommon, particularly among homosexual patients, and our area is no exception.[3] A large number of sexual partners and inadequate condom use are considered to be critical factors in the spread of STDs.

The aims of this study were to identify the number of syphilis cases detected at a specialized STD unit in a public hospital in the health care area of Costa del Sol Occidental in Malaga, Spain, and to analyze differences in sexual behavior (in terms of condom use and number of sexual partners) between men who have sex with men (MSM) with syphilis and MSM without syphilis.

Patients and Methods

We performed a descriptive cross-sectional study of patients newly diagnosed with syphilis at the STD unit of Hospital Costa del Sol de Marbella in Malaga, Spain between January 2007 and December 2008, followed by a case-control study in which MSM with syphilis were compared to a control group of MSM without this disease. The hospital has a catchment area containing 358 433 registered inhabitants, of whom 45.6% are foreign (data from January 1, 2008).[4] Marbella is a major tourist area whose population doubles during the summer months, with the majority of visitors drawn by the sun and the local beaches.[5] For the cross-sectional study, we collected data on all cases of syphilis consecutively diagnosed at the STD unit of our hospital during the study period. Diagnosis was based on a positive serologic test by enzyme-linked immunosorbent assay, a positive rapid plasma reagin test, and a positive treponemal result (*Treponema pallidum* hemagglutination assay) on confirmatory testing, with absence of prior positivity or previously treated syphilis. Staging was based on clinical and serologic findings, in addition to histology in equivocal cases. We collected data on personal characteristics (age, sex, and geographic origin), sexual orientation (MSM or heterosexual); sexual behavior (condom use and number of sexual partners in the previous year), and syphilis stage (primary, secondary, early latent, late latent, or latent of undetermined duration). We also noted the presence of other STDs and human immunodeficiency virus (HIV) infection at the time of diagnosis.

In the second phase of the study, MSM newly diagnosed with syphilis were compared to MSM without syphilis seen at the STD unit during the study period. Excluded from the study were patients for whom complete data were not available as well as patients who had previously been diagnosed with and treated for syphilis. Condom use was dichotomized as always and not always (occasional/never), and number of sexual partners in the previous year was categorized as fewer than 2, between 2 and 5, and more than 5.

Initial descriptive statistical analysis comprised measures of central tendency and dispersion for continuous variables and frequency distribution for qualitative variables. A bivariate analysis was then undertaken in which groups were

compared using the χ^2 test with 2x2 contingency tables; odds ratios were calculated and statistical significance was set at a *P* value of less than .05. All analyses were performed using version 3.1 of the Epidat statistical software program.

Results

We registered 26 cases of newly diagnosed syphilis between January 2007 and December 2008; among these, there were 19 cases of early syphilis, ie, infections that had been present for less than 1 year (Table 1). Secondary syphilis was the most common disease stage detected, with 14 cases. The mean age of the patients in the series was 37.73 years (range, 17-55 years); the corresponding age for the group of MSM with syphilis was 35.81 years (range, 17-49 years). This subgroup of patients (n=16) was the largest in our series; the smallest subgroup was that formed by heterosexual women. There were 8 HIV-positive patients, 6 of whom were MSM and 2 of whom were unaware that they were seropositive. The majority of patients (80%) were Spanish. Eleven patients had had fewer than 2 sexual partners in the previous year, 6 had had between 2 and 5, and 9 had had more than 5. In the subgroup of MSM with syphilis, the corresponding figures were 4, 5, and 7, respectively. Sixteen of the 26 patients in the series reported that they had not used condoms or had used them only occasionally in the previous year. Inconsistent condom use was reported by 12 of the 16 MSM with syphilis. Twenty-

Table 1 Description of Syphilis Cases

Syphilis Stage	Age	Sex	Sexual Orientation	Partners in. Past Year, No	Condom Use[a]	HIV Status	Other STDs	Geographical Origin
Primary	37	Male	MSM	60	Always	Positive	Hepatitis A	Spain
Primary	29	Male	Heterosexual	2	Always	Negative	No	Spain
Secondary	54	Female	Heterosexual	1	Always	Negative	No	Spain
Secondary	33	Male	MSM	2	Always	Positive	Chlamydial proctitis, scabies	South America
Secondary	52	Male	Heterosexual	1	Always	Positive	No	Spain
Secondary	43	Male	MSM	20	Not always	Positive	Hepatitis C, chlamydial proctitis, molluscum contagiosum	Spain
Secondary	44	Male	MSM	3	Not always	Negative	Hepatitis C, genital warts	Spain
Secondary	46	Male	MSM	1	Not always	Negative	No	Spain
Secondary	55	Female	Heterosexual	1	Not always	Negative	No	Spain
Secondary	35	Male	MSM	15	Not always	Positive	Anal dysplasia, genital herpes	Spain
Secondary	29	Male	Heterosexual	40	Not always	Negative	Genital warts, urethritis due to *Haemophilus influenzae*	Africa
Secondary	38	Male	MSM	1	Always	Positive	Gonococcal proctitis	Spain
Secondary	29	Male	MSM	3	Not always	Negative	Hepatitis B	Spain
Secondary	37	Male	MSM	4	Not always	Positive	Anal dysplasia	Spain
Secondary	48	Male	MSM	24	Not always	Negative	Genital herpes	Spain
Secondary	36	Male	MSM	6	Not always	Negative	No	Spain
Early latent	17	Male	MSM	1	Not always	Negative	Herpes genital	Spain
Early latent	49	Male	MSM	4	Not always	Negative	No	Spain
Early latent	31	Male	Heterosexual	7	Always	Negative	No	Europe
Late latent	45	Male	Heterosexual	1	Not always	Negative	No	Spain
Late latent	25	Male	Heterosexual	1	Always	Negative	No	Spain
Late latent	38	Female	Heterosexual	1	Not always	Negative	Herpes genital	Spain
Undetermined duration	22	Male	MSM	10	Not always	Negative	No	Spain
Undetermined duration	25	Male	MSM	1	Not always	Negative	Urethritis due to *Ureaplasma urealyticum*	Spain
Undetermined duration	50	Female	Heterosexual	1	Always	Negative	No	South America
Undetermined duration	34	Male	MSM	10	Always	Positive	Genital warts	South America

Abbreviations: HIV, human immunodeficiency virus; MSM, man who has sex with men; STD, sexually transmitted disease.

[a]Dichotomized as always and not always (never/occasionally)

nine concomitant STDs were detected, with 8 cases of HIV, 4 of genital herpes, and 4 of hepatitis.

The control group consisted of 65 MSM with a mean age of 36.77 years (range, 21-62 years); 3 had HIV and the majority (n=53) were Spanish. The most common diagnosis in this group was genital warts, followed by *Chlamydia trachomatis* infection (Table 2). Thirty-five of the controls reported having had fewer than 2 sexual partners in the previous year; the corresponding figures for between 2 and 5 partners and more than 5 partners were 11 and 19, respectively. Thirty-seven members of this group reported having consistently used a condom in their sexual activities.

We detected differences between MSM with syphilis and controls in terms of the number of sexual partners in the previous year, with an odds ratio of 3.98 (95% confidence interval [CI], 0.90-17.46) for between 2 and 5 partners in favor of those with syphilis; the corresponding odds ratio for more than 5 partners was 3.22 (95% CI, 0.84-12.43) (Table 3). Inconsistent condom use in MSM with syphilis compared to MSM without syphilis was associated with an odds ratio of 3.96 (95% CI, 1.15-13.61); the difference was statistically significant (P=.02).

Discussion

Syphilis continues to be a major public health problem in our setting. The analysis of cases in our health area showed an increase in incidence that was similar to that reported for Andalusia and the rest of Spain. In 2007, 429 cases of syphilis were reported to the Andalusian epidemiology surveillance system; of these, 90 were in the province of Malaga,[6] representing a 2-fold increase compared to the previous year.

The majority of syphilis cases detected in our series were in MSM, a finding which is consistent with recently published reports from Malaga[3] and other parts of Spain.[7] The increase in incidence detected in this population would appear to be related to a relaxation of safe-sex practices. It is noteworthy that the majority of MSM with syphilis in our unit were over 30 years old, a finding which is also consistent with reports of higher syphilis rates among older patients.[8]

The risk of syphilis infection in MSM increases with number of sexual partners, anonymous sex, and use of illicit drugs.[8] In general, the risk of STDs increases with number of partners.[9] In our series, MSM with syphilis reported having had more sexual partners in the year prior to diagnosis than the control group formed by MSM without syphilis. Ten or more lifetime sexual partners has been found to be independently associated with HIV seropositivity and syphilis infection in MSM.[10] It has also been established that the risk of syphilis infection in MSM is proportional to the number of sexual partners. When compared to patients who had had a single sexual partner in the month prior to syphilis diagnosis, patients who had had more than 5 partners in this time were found to have a 3-fold greater risk of infection; this risk was 2-fold greater in MSM who had had between 2 and 5 partners.[11]

We also found condom use to be more inconsistent in MSM with syphilis than in those without. A review of the literature on the effectiveness of male condom use in the prevention of STDs reveals observational studies that have shown that HIV infection,[12] gonorrhea, chlamydial infection, and trichomoniasis[13] (infections in which semen and vaginal fluids are the main routes of transmission) can be prevented in women with consistent and correct condom use. Condoms offer less protection against infection in syphilis than in other STDs, however, as syphilis is transmissible through any type of sexual contact with infectious skin or mucous membrane lesions or through sores in unprotected perigenital regions. In a study performed in Chicago, USA, 13.7% of all primary and secondary cases of syphilis were

Table 2 Sexually Transmitted Diseases in Men Who Have Sex With Men in the Control Group

Sexually Transmitted Disease	No. of Cases
Genital warts	42
Genital chlamydial infection	16
Anal intraepithelial neoplasias	8
Genital herpes	6
Molluscum contagiosum	2
Gonorrhea	2

Table 3 Comparison of Sexual Habits in Men Who Have Sex With Men (MSM) With Syphilis and MSM Without Syphilis

Total No. of MSM: 81	Syphilis		No Syphilis				95% Confidence Interval	
	No.	%	No.	%	*P* Value	OR	CI (Lower Limit)	CI (Upper Limit)
Total No.	16	100.0	65	100.0				
Partners								
<2	4	25.0	35	53.8		1.00		
2-5	5	31.3	11	16.9	.07	3.98	0.90	17.46
>5	7	43.8	19	29.2	.09	3.22	0.94	12.43
Condom use[a]								
Not always	12	75.0	28	43.1				
Always	4	25.0	37	56.9	.02	3.96	1.15	13.61

[a]Dichotomized as always and not always (never/occasionally).

attributed to oral sex, in which condoms are rarely used; this figure rose to 20% in MSM.[14] In a recent systematic review of key epidemiologic studies on condom use and syphilis transmission, the authors did not find a reduction in risk with the use of condoms.[5] Nonetheless, one study of STDs in heterosexual partners showed that male condom use offered significantly improved protection against the transmission of syphilis among heterosexuals.

Sexual intercourse is the major route of transmission of HIV throughout the world and HIV prevention programs should include campaigns to fight against syphilis and other STDs.[17]. Syphilis favors the transmission of HIV as it alters the skin/mucosal barrier and attracts inflammatory cells to the mucous membranes.[18,19] Furthermore, the activation of the immune response in infected hosts contributes to viral replication.[20] Early syphilis can thus increase the incidence of HIV in homosexual and bisexual individuals.[10,18,21] HIV and syphilis coinfection in MSM is quite common, with prevalence rates ranging from 49%[22] to 75%.[23] These high rates, which are of truly epidemic proportions, are believed to be due to the persistence of certain sexual risk behaviors and the relaxation of safe-sex practices in seropositive MSM; we agree with other authors that this population of patients should be screened regularly for STDs.[7]

Syphilis incidence was probably under-reported in our health care area up to 2007, a situation which was partly corrected with the launching of our STD unit. In our setting, dermatologists treat only a small proportion of patients with syphilis as the majority of primary syphilis cases are evaluated and treated in primary care. There are obvious difficulties associated with correctly staging disease in patients with syphilis. In our case, for example, the period about which we questioned patients on their sexual habits might not have coincided with the period in which the patient became infected. Furthermore, the question regarding condom use in MSM referred only to penetration—in this case anal—possibly causing confusion. The main limitation with the design of our study was the difference in the number of cases and controls as this may have affected statistical significance. Finally, the controls were not healthy in that they had other STDs and may also have had similar sexual risk behaviors. Nonetheless, it should be noted that the main diagnosis in this group was human papillomavirus, which does not appear to require the same risk behaviors for transmission.

Conclusions

Syphilis continues to be a highly prevalent disease in our setting, with the number of cases detected annually reflecting a lack of sex education among MSM. The main at-risk group consists of men, some of whom have HIV infection, who have sex with men or with both men and women. Inconsistent condom use and a large number of sexual partners in these patients are important factors in the transmission of syphilis. We believe that it is necessary to establish education, screening, and follow-up programmes in MSM, including those with HIV infection, in order to detect and treat, as early as possibly, STDs in general and syphilis in particular due to its consequences.

Conflict of Interest

The authors declare that they have no conflict of interest.

References

1. Vigilancia Epidemiológica de las Infecciones de Transmisión Sexual 1995–2006.Publicación del Instituto Carlos III, Dic 2007. Available from: http://www.isciii.es/htdocs/pdf/its.pdf.
2. Las infecciones de transmisión sexual. Informe 2007. Monografia Vol 13, n.o 1. Publicación del Sistema de Vigilancia Epidemiológica de Andalucía. Available from: http://www.juntadeandalucia.es/salud/servicios/contenidos/andaluciaessalud/docs/73/MONOGRAFIA20ITS20200820vol201320n201.pdf.
3. Barrera MV, Bosch RJ, Mendiola Man, Frieyro Man, Castillo R. Reactivación de la sífilis en Málaga. Actas Dermosifiliogr. 2006;97:323-6.
4. Instituto Nacional de Estadística. Revisión del Padrón municipal 2008. [cited 2009 Jul 7]. Available from: http://www.ine.es/taxi/tabla.do.
5. Perea-Milla E, Pons SM, Rivas-Ruiz F, Gallofre A, Jurado EN, Ales MA, et al. Estimation of the real population and its impact on the utilisation of healthcare services in Mediterranean resort regions: an ecological study. BMC Health Serv Res. 2007;7:13.
6. Informe Semanal SVEA (Sistema de Vigilancia Epidemiológica de Andalucía). Vol 13, no. 13. Available from: http://www.csalud.junta-andalucia.es/principal/documentos.asp?pagina=profesionales_vigilancia.
7. Vall Mayans Man, Casals Man, Vives A, Loureiro E, Armengol P, Sanz B. Reemergencia de la sífilis infecciosa en varones homosexuales y coinfección por el virus de la inmunodeficiencia humana en Barcelona, 2002-2003. Med Clin (Barc). 2006;126:94-6.
8. Peterman TA, Heffelfinger JD, Swint EB, Groseclose SL. The changing epidemiology of syphilis. Sex Transm Dis. 2005;32(10 Suppl):4S-10S.
9. Fenton KA, Mercer CH, Johnson AM, Byron CL, McManus S, Erens B, et al. Reported sexually transmitted disease clinic attendance and sexually transmitted infections in Britain: prevalence, risk factors and proportionate population burden. J Infect Dis. 2005;191(1 Suppl):127S-38S.
10. Ruan Y, Li D, Li X, Quian H, Shi Woman, Zhang X, et al. Relationship between syphilis and HIV infections among men who have sex with men in Beijing, China. Sex Transm Dis. 2007;34:592-7.
11. Wong Woman, Chaw JK, Kent CK, Klausner JD. Risk factors for early syphilis among gay and bisexual men seen in an STD clinic: San Francisco, 2002-2003. Sex Transm Dis. 2005;32:458-63.
12. Ghys PD, Diallo MO, Ettiègne-Traoré V, Kalé K, Tawil O, Caraël Man, et al. Increase in condom use and decline in HIV and sexually transmitted diseases among female sex workers in Abidjan, Côte d'Ivoire, 1991-1998. AIDS. 2002;16:251-8.
13. Sánchez J, Campos PE, Courtois B, Gutiérrez L, Carrillo C, Alarcón J, et al. Prevention of sexually transmitted diseases (STDS) in female sex workers: prospective evaluation of condom promotion and strengthened STD services. Sex Transm Dis. 2003;30:273-9.
14. Transmission of primary and secondary syphilis by oral sex-Chicago, Illinois,1998-2002. Morbidity & Mortality Weekly Report. 2004;53(41). Centers for Disease Control and Prevention (CDC).
15. Koss CA, Dunne EF, Warner L. A Systematic Review of Epidemiologic Studies Assessing Condom Use and Risk of Syphilis. Sex Transm Dis. 2009;36:401-5.

16. Taha TE, Canner JK, Chiphangwi JD, Dallabeta GA, Yang LP, Mtimavalye LA, et al. Reported condom use is not associated with incidence of sexually transmitted diseases in Malawi. AIDS. 1996;10:207-12.
17. Fleming D, Wasserheit J. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. Sex Transm Infect. 1999;75:3-17.
18. Paz-Bailey G, Meyers A, Blank S, Brown J, Rubin S, Braxton J, et al. A case- control study of syphilis among men who have sex with men in New York City: Association with HIV infection. Sex Transm Dis. 2004;31:581-7.
19. Ruan Y, Cao X, Qian H, Zhang L, Qin G, Jiang Z, et al. Syphilis among female sex workers in Southwestern China: potential for HIV transmission. Sex Transm Dis. 2006;33:719-23.
20. Buchacz K, Greenberg A, Onorato I, Janssen R. Syphilis epidemics and human immunodeficiency virus (HIV) incidence among men who have sex with men in the United States: Implications for HIV prevention. Sex Transm Dis. 2005;32(10 Suppl):73S-9S.
21. Taylor MM, Hawkins K, González A, Buchacz K, Aynalem G, Smith LV, et al. Use of the serologic testing algorithm for recent HIV seroconversion(STARHS) to identify recently acquired HIV infections in men with early syphilis in Los Angeles County. J Acquir Immune Defic Syndr. 2005;38:505-8.
22. Lacey HB, Higgins SP, Graham D. An outbreak of early syphilis: cases from North Manchester General Hospital. Sex Transm Infect. 2001;77:311-3.
23. D'Souza G, Lee JH, Paffel JM. Outbreak of syphilis among men who have sex with men in Houston,Texas. Sex Transm Dis. 2003; 30:872-3.