

Sexual risk behavior and demand for prophylaxis for sexually transmitted diseases

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Objective: To analyze the characteristics of patients coming to the emergency room seeking postexposure prophylaxis for sexually transmitted diseases (STDs) after high-risk sex.

Methods: Over a 6-month period, emergency requests for postexposure STD prophylaxis were reviewed. We recorded epidemiologic variables, type of sexual risk behavior, reason for coming to the emergency room, STD prophylaxis prescribed, and cost.

Results: A total of 189 patients with a mean (SD) age of 32.5 (8.3) years were included; 162 (85.7%) were men and 67.2% were Spanish. One hundred thirteen (59.8%) were men who had sex with men; the partner was seropositive for human immunodeficiency virus (HIV) in 30.7% of the cases or of unknown serostatus in 61.9%. Condoms were used by 49.7%, but 45.5% reported breakage. The most frequent practice was anal penetration (active or passive) (53.4%). Twenty-eight days of preventive HIV antiretroviral therapy was prescribed for 85.2%; 77.2% also received prophylactic antibiotics for other STDs, and 22.8% started immunization against hepatropic viruses. The mean cost per visit and preventive treatment administered or prescribed in the emergency department was €858 (€275).

Conclusions: Sexual risk behavior is a frequent reason for emergency department visits, particularly among men who have sex with men. A large proportion of patients come because a condom has broken, but nearly half do not use a condom even when they do not know the serostatus of the partner or know the partner is seropositive for HIV. Emergency care and pharmacologic treatment for these patients are costly. [Emergencias 2013;25:437-444]

Keywords: Sexual risk behaviors. Sexually transmitted diseases. Prevention. Preventive therapy. Health care costs.

Introduction

Sexual intercourse (SI) is one of several routes for the transmission of infectious diseases. Risky sexual behavior involves unprotected sex with a carrier of a transmissible disease or a partner whose disease status is unknown. SI with more than one partner or sex professionals has been identified as a risk factor for sexually transmitted diseases (STD). Some types of SI are considered riskier, such as anal sex, with greater likelihood of mucocutaneous disruption and lesions. The best way to avoid STD is prevention, and the use of a condom is the primary method¹.

The incidence of STD is increasing throughout the Western world, due in part to the demystifica-

tion of AIDS as a fatal disease and the emergence of high activity antiretroviral therapy (HAART) as treatment and prophylaxis against human immunodeficiency virus (HIV). A reduction in the use of barrier measures is partly due to lower risk perception^{2,3}. The rise of new technologies such as the internet and social networks, globalization, migratory phenomena and changes in sexual habits and tastes have led to increased sexual encounters between strangers or in groups, and the prevalence of male homosexual relations has increased⁴. SI often occurs in the context of alcohol or drug consumption, which tends to facilitate sexual relations and, importantly, reduce the perception of risk, so preventive measures are not taken⁵. All this means that the incidence of HIV in-

fection has not decreased and there has been an increase in classic STD such as syphilis, gonorrhea or trichomoniasis, as well as other diseases considered by some authors as more contemporary, such as human papilloma virus, hepatitis or lymphogranuloma venereum⁶.

There is no general consensus on the effectiveness of prophylactic treatment for STDs, and particularly for HIV; it does not prevent disease transmission in 100% of cases and, as noted, is not without side effects; costs are also high. The efficacy of such prophylaxis, but increasingly better tolerance has been shown⁷. The danger of infection with other viruses also exists since full immunization is only possible for hepatitis A and B, but not for other viruses such as human papillomavirus. Antiviral therapy is costly and associated with side effects; in addition, it does not guarantee later infection with the disease or others associated with it⁸. Regarding classical STDs, modern antibiotic treatment is more appropriate and effective.

After SI, citizens have at their disposal several points of care to solicit prophylactic measures to combat possible infection with an STD. The aim of this study was to analyze the characteristics of patients who visited a hospital emergency department (ED) for this reason, and the short-term economic costs of treating them.

Method

We performed a cross-sectional descriptive study with retrospective collection of all visits for this reason made to the ED, Hospital Clínic Barcelona and triage identified as patients with exposure to organic fluids or infectious diseases from other people due to risky SI and demand for post-exposure prophylaxis (PEP). We excluded victims of sexual assault, patients exclusively soliciting post-coital contraception, and those with occupational exposure to biological fluids (health personnel) or accidental puncture. The study period was 6 months, from July 1 to December 31, 2011.

Variables considered included epidemiological data (age, sex, country of birth and municipality of residence), day of ED visit, time since exposure, type of SI, partner characteristics, condom use, risk factors, drug consumption and reason for the visit. We also recorded the prophylactic treatment administered (for HIV, hepatotropic virus or other STDs) and calculated the costs involved. We reviewed each patient's medical record to deter-

mine whether this risk behavior was common and whether or not they patient attended a mandatory follow-up appointment with our hospital department of infectious diseases. The risk of HIV transmission was categorized as high, moderate, low or absent according to previously described criteria⁹. The study was approved by the hospital Research Ethics Committee.

Results are expressed as absolute frequencies, percentages (%), mean (SD) or median (25th and 75th percentiles) according to whether the variable in question was qualitative or quantitative.

Comparison between quantitative variables was performed using the nonparametric Mann - Whitney test and comparison between qualitative variables was performed using Fisher's exact test. Statistical analysis was performed with SPSS version 20. Differences with a p value ≤ 0.05 were considered statistically significant.

Results

The study included 189 patients with a mean age of 32.5 (8.3) years. This represented 0.97% of medical emergencies (19,429) and 0.43% of all emergencies (43,716) attended during the study period. Of the 189 cases, 162 were men (85.7%), 24 women (12.7%) and 3 (1.6%) transsexuals. Two thirds (67.2%) were Spaniards and 16.4% were from other European countries, including Italians (5.3%), and French (4.8%); 15.4% were born in non-European countries, the most prevalent being Argentinians (3.2%). Most (80.9%) were currently resident in Barcelona, while 19.1% were tourists or travelers.

Most visits took place on a Monday (34 cases, 18%) and least on a Wednesday (21 cases, 11.1%). Half visited the ED within 18 hours of the sexual encounter (P25:6; P75:32) occurring mostly over the weekend (Saturday or Sunday: 69 cases, 36.5%).

The general characteristics of the risk behaviors are shown in Table 1. One hundred and thirteen patients (59.8%) were homosexual men and 175 reported SI with a HIV-positive partner (30.7%) or with a partner of unknown serostatus (61.9%). None of the patients were known to be HIV-positive. A condom was used by 49.7%, but almost half (45.5%) of these patients reported condom breakage or loss. Anal penetration, active or passive, was the most frequent risk behavior (53.4%) and SI was sometimes multiple (orgies) and/or anonymous (8 cases). A minority (8.5%) reported alcohol consumption alone or with other drugs

such as cocaine, cannabis and poppers; 7.9% of the patients were being treated with psychotropic medication.

Table 2 shows some specific features of patients according to the use or non-use of a condom. The only significant difference observed in reason for ED visit was the fear of infection with HIV or other STDs in the group of people who did not use a condom ($p < 0.001$).

Table 3 shows other patient characteristics, according to same-sex or heterosexual SI. The male homosexual group was significantly older ($p = 0.001$) and showed a significantly higher risk of HIV infection ($p < 0.001$). Although 189 (12.7%) patients were women, none of these visited the ED for fear of infection acquired in SI with another woman.

Depending on the risk assessment of disease transmission, time from exposure and medical history, patients did or did not receive prophylaxis for STD and pregnancy prevention if necessary, with a variable combination of antiretrovirals, antibiotics, vaccine and gamma globulin for hepatitis B and emergency contraception (Table 4). HAART was prescribed for 85.2% of the study sample; in the first phase of the study zidovudine, lamivudine and lopinavir/ritonavir were used, whereas in the last phase atazanavir, zidovudine/lamivudine were used, usually prescribed for 28 days and provided by the hospital pharmacy. Antibiotics were indicated for 77.2% of patients, in the form of a single dose of ceftriaxone, azithromycin and sometimes metronidazole. Gamma globulin and vaccine for hepatitis B prevention were used in 22.8% of the series. Emergency contraception with levonorgestrel was prescribed in 3 cases. The cost of pharmaceutical treatment per patient for all these cases ranged from 0 euros (12 patients received no prophylaxis) to 921 euros. Mean drug cost per patient was 636 (271 euros). To this should be added the cost of ED attention estimated at 223 euros per patient. Mean total cost per patient was 858 (275) euros.

Of 189 cases, 14.1% had previously received prophylactic HAART for other episodes of sexual risk behavior and 25.9% underwent serological tests for HIV. A minority (8.2%) of patients had previously been treated for an STD, while 45.7% declared hepatotropic virus immunity. Most (76.4%) of the patients attended the first follow-up appointment at the department of infectious diseases. Depending on risk assessment, these patients were also referred to the vaccinations center of our hospital, to complete prophylaxis for hepatotropic virus.

Table 1. General characteristics of risk sexual behavior (N = 189)

	n (%)
Type of relationship	
Male homosexual	113 (59.8)
Heterosexual	40 (21.2)
Bisexual	5 (2.6)
Not specified	31 (16.4)
Type of sexual activity	
Anal penetration	52 (27.5)
Anal reception	49 (25.9)
Vaginal reception	21 (11.1)
Vaginal penetration	17 (9.0)
Oral reception	16 (8.5)
Oral penetration	2 (1.1)
Other	32 (16.9)
Condom use	
Yes	94 (49.7)
No	71 (37.6)
Not specified	24 (12.7)
Type of partner or circumstance	
Unknown partner	136 (71.9)
Known partner	19 (10.1)
Regular partner	12 (6.3)
Sex worker	8 (4.2)
Group orgy	4 (2.1)
Anonymous sex site	4 (2.1)
Not specified	6 (3.2)
Partner's HIV status	
Unknown	117 (61.9)
HIV-positive	58 (30.7)
HIV-negative	14 (7.4)
Reason for ED visit	
Fear of STD or HIV	89 (47.1)
Breakage or loss of condom	86 (45.5)
Presence of blood or skin/mucosa lesions	6 (3.2)
Anterograde or temporary amnesia	6 (3.2)
General malaise	2 (1.1)
Concomitant substance use	
Alcohol and/or drug	16 (8.5)
Psychopharmacological medication	15 (7.9)

ED: Emergency Department; STD: sexually transmitted disease; HIV: human immunodeficiency virus.

Discussion

Hospital Clinic Barcelona is a referral hospital for PEP and HIV/AIDS treatment. There is an infectious disease specialist on call 24 hours a day and many patients at risk of STD visit the hospital for this reason. On ED arrival, these patients are categorized as level 5 (lowest priority level) by the MAT/SET nursing triage system in use¹⁰. According to the present study, one case of sexual risk behavior is attended in the ED every 22 hours, representing 0.46% of all emergencies and 1.47% of medical emergencies, but this probably does not reflect the real incidence of such behavior since Barcelona city has become a sex tourism destination, especially for male homosexuals^{11,12}. The fact that 63 patients (33% of the present series) were from 22 different countries other than Spain, and 36 (18.9%) did not reside in the municipality of

Table 2. Patient characteristics according to use or non-use of condoms (N = 189)

Variable	Without a condom n (%)	With condom n (%)	P value*
Age in years (median; p 25-p 75)	32 [28; 39]	31 [26; 38]	0.463
Sex			1
Male	76 (86.4)	80 (85.1)	
Female	11 (12.5)	12 (12.8)	
Transexual	1 (1.1)	2 (2.1)	
Country of origin			0.430
Spain	57 (64.8)	65 (70.7)	
Other European countries	18 (20.5)	12 (13)	
Non-European countries	13 (14.8)	15 (16.3)	
Resident in Barcelona			0.06
Yes	66 (75)	81 (87.1)	
No	22 (25)	12 (12.9)	
Sex on/just before holiday days, Fridays			0.550
Yes	53 (60.2)	52 (55.3)	
No	35 (39.8)	42 (44.7)	
Time between sexual encounter and ED visit			0.301
≤ 72 h	64 (91.4)	81 (96.4)	
> 72 h	6 (8.6)	3 (3.6)	
Regular partner			0.810
Yes	10 (11.4)	9 (9.6)	
No	78 (88.6)	85 (90.4)	
Male homosexual activity			1
Yes	68 (77.3)	72 (76.6)	
No	20 (22.7)	22 (23.4)	
Reason for ED visit			< 0.001
Fear of STD or HIV	78 (88.6)	5 (5.3)	
Breakage or loss of condom	0 (0)	86 (91.5)	
Amnesia	4 (4.5)	1 (1.1)	
Presence of blood or skin/mucosa lesions	5 (5.7)	1 (1.1)	
General malaise	1 (1.1)	1 (1.1)	

ED: Emergency Department; STD: sexually transmitted disease; HIV: human immunodeficiency virus.

Table 3. Characteristics of patients and the presence of various risk factors according to heterosexual or homosexual activity (N = 189)

Variable	Heterosexual activity n (%)	Male homosexual activity n (%)	P value*
Age in years (mean; p 25- 75)	29 [24; 31]	33 [28; 39]	0.001
Sex			< 0.001
Male	19 (44.2)	137 (97.9)	
Female	24 (55.8)	0 (0)	
Transexual	0 (0)	3 (2.1)	
Partner HIV+			0.335
Yes	9 (20.9)	48 (34.3)	
No	4 (9.3)	10 (7.1)	
Receiving HAART	0 (0)	1 (0.7)	
Status unknown	30 (69.8)	81 (57.9)	
Condom use			1
Yes	22 (52.4)	72 (51.4)	
No	20 (47.6)	68 (48.6)	
Risk of HIV infection			< 0.001
None or low	26 (63.4)	39 (29.3)	
Moderate or high	15 (36.6)	94 (70.7)	
Consumption of alcohol/drugs			0.214
Yes	6 (14)	10 (7.1)	
No	37 (86)	130 (92.9)	
Receiving anti-psychotics			1
Yes	3 (7)	12 (8.6)	
No	40 (93)	128 (91.4)	

*Fischer's exact test. HAART: High activity antiretroviral therapy; HIV: human immunodeficiency virus.

Barcelona, implies that at least some of these patients were part of this sex tourism.

Latex condom use is known to be the simplest and most effective method to prevent disease transmission during SI¹³, yet a major subset of in-

Table 4. Evaluation of the cost of Emergency Department visit and prophylactic medication for sexually transmitted disease (N = 189)

Variable	N (%)
ED Visit	189 (100)
Treatment with antiretroviral drugs	161 (85.2)
Treatment with antibiotics	146 (77.2)
Prophylactic treatment of hepatitis B	43 (22.8)
Emergency contraception	3 (1.6)
Drugs administered or prescribed in the Emergency Department: dosage schedule	Economic cost per patient
Visit to the emergency room	223.00 €
Zidovudine: 300 mg/12 h/oral	134.86 €
Lamivudine: 300 mg/24 h/oral	97.97 €
Lopinavir/Ritonavir: 200/50 mg/12 h/oral	468.97 €
Atazanavir: 400 mg/24 h/oral	420.00 €
Zidovudine/lamivudine: 300/150 mg/12 h/oral	272.00 €
Ceftriaxone: 1 g/IM	6.07 €
Azithromycin: 1 g/oral	6.37 €
Metronidazole: 2 g/oral	2.00 €
Gamma globulin IM	138.72 €
Vaccine IM	16.36 €
Levonorgestrel: 0.75 mg/oral	18.76 €

IM: Intramuscular.

dividuals did not use a condom in risky SI, even with a HIV-positive partner in some cases. Confidence in antiretroviral therapy, fear of losing an affective relationship or substance-induced mental confusion are likely involved in such behaviour¹⁴, but later risk awareness motivates a visit to the ED¹⁵⁻¹⁷. In addition, 8% of the patients were receiving psychopharmacological treatment indicating possible mental disturbance and reduced perception of risk in unsafe SI¹⁸⁻²⁰. Indeed, depressive symptoms have been associated with unprotected sex²¹.

Some people engaging in unsafe SI are knowledgeable of the risk, such as male homosexuals, and do use condoms as barrier method. However, it is noteworthy that 45% of them reported condom rupture when interviewed in the ED, probably in the context of more aggressive or prolonged SI, but the possibility of non-use cannot be ruled out since some later confess they had lied in order to ensure PEP treatment. But condom rupture is always possible (0.4-15%)²² and is associated with various factors such as improper placement, friction with rings or nails, or reduced lubrication due to prolonged sex, and could account for 15-30% of ED visits for unsafe sex²³.

Anal sex has also increased in heterosexual couples, associated with a higher probability of HIV transmission than vaginal sex²⁴. Another risk factor, although lower, is oral sex; none of the persons included in this study used a condom for this type of sex, probably due to lower risk perception. The availability of condoms that are more resistant to intense friction (nitrile or polyurethane) involved in anal or very prolonged vaginal sex, which do not reduce sensitivity and possess organoleptic characteristics favoring oral sex, could help decrease condom rupture and STD rates²⁵. However, the cost of such condoms is higher, which is an important factor in their lower use. Lastly, it should not be forgotten that female condoms are available, equally effective in preventing HIV and other STDs, but their use is not widespread in Spain²⁶.

In relation to antibiotic treatment prescribed in the ED to prevent other STDs, prophylaxis was complete in all cases since a single dose was administered. In contrast, for HIV and complete hepatotropic virus immunization, a follow-up visit was needed; unfortunately only 76% of the cases in this series subsequently attended the appointment at the department of infectious diseases. Transitory visitors may explain part of the non-attendance, and perhaps these individuals did actually attend another center. To increase compliance

with these appointments, as from January 2012, our ED physicians are instructed to prescribe and provide HIV prophylactic treatment for 3 days, to be continued by the department of infectious diseases. This policy is designed to ensure serological monitoring and evaluation of treatment efficacy as well as possible side effects²⁷. Adherence to treatment is important and the reduced number of tablets per day for prophylaxis contribute to greater efficiency at lower cost, as in the treatment of HIV²⁸. Follow-up visits could also be used to provide advice and guidance to high-risk patients and this may help reduce recurrence²⁹.

Prophylaxis for all STD is costly, particularly for HIV. Although some authors have shown the failure of HIV prophylaxis following exposure³⁰ or limited impact on public health³¹, others consider that post-exposure HAART significantly reduces the risk of seroconversion³² and AIDS, to the extent that authors in the United States have proposed pre-exposure chemoprophylaxis for a population of male homosexuals. This treatment reduces new cases of HIV infection by an estimated 13% and improves quality of life, but at a cost of \$172,000 per quality year³³. However, the advantages of pre-exposure prophylaxis for risk groups (effectiveness) are set against certain disadvantages (cost, more sexual risk behavior with less condom use, increased risk of other STDs and the development of drug resistance)³⁴.

None of the patients who attended the ED requesting PEP were known to be HIV-positive. Had there been any HIV-positive cases, HAART prophylaxis would not have been prescribed. Similarly, after 72 hours of exposure, as occurred in 9 of our patients, HAART prophylaxis would not have been prescribed since it is considered ineffective, although PEP was explicitly requested by one of these patients. PEP must be taken into consideration along with other strategies to reduce HIV transmission³⁵, along with prophylaxis to prevent other STD and subsequent monitoring. The appearance of an effective anti-HIV vaccine may substantially change all these cost-effectiveness approaches³⁶.

In addition to the economic cost of PEP prescribed in the ED, further public health costs are generated by the need for follow-up measures including infectious disease department assessment, laboratory analyses etc., which we have not included in our analysis. Whatever the cost, it will always be less than the cost of treating the disease. In Great Britain, the annual cost of treating AIDS is estimated at 1,000 million pounds³⁷. However, in some studies, the cost/effectiveness analy-

sis of PEP was only cost-effective when applied to high-risk sexual behavior patients engaging in anal receptive sex with a HIV-positive partner³⁸⁻⁴⁰.

Three quarters (76%) of our patients attended the infectious diseases department outpatient clinic: a good rate in our opinion, given that 19.1% of our patients were tourists or non-resident in Barcelona. We do not know the reason for non-attendance of some patients; they may simply have decided against it, although we cannot rule out the possibility of their attending elsewhere. Even if there had been 100% attendance, there would have been no reduction of drug costs: HIV prophylaxis is always given for 28 days. Non-attendance reduces patient safety, since possible side effects of the medication and/or eventual seroconversion are not monitored.

Our results strongly suggest recurrence of high-risk sexual behavior judging from the number of individuals who had previously received prophylactic treatment or had an STD. Furthermore, a significant number of these patients were aware of the risks, since they were vaccinated against hepatitis and/or had regular check-ups to verify their HIV status. It has been estimated that the risk of syphilis or HIV infection is 140 times higher in homosexual than heterosexual men, suggesting that this population is at high risk for STDs⁴¹.

The homosexual men attending our ED are more aware of the risks than others, but their use of condoms is not greater.

The present study is the first to describe the characteristics of ED patients in search of prophylaxis after risk sexual behavior. However, it has certain limitations; it was performed retrospectively in a single center and only included 189 cases. The study did not include a specific survey to complete sociodemographic information on drug use/abuse and sexual behavior. We did not follow the patients after the first post-ED outpatient clinic and/or vaccination center, so we are unable to answer the question about effectiveness of the measures taken and their additional cost. Nor did the study address the incidence of unsafe sex between adolescents since our hospital ED only attends adult patients over 18 years of age⁴². We are unable to compare our results with those of other hospitals, but can provide an estimate of the incidence of ED visits after risk sexual behavior based on the population served by our hospital: 1 per 76.4 inhabitants per year.

In conclusion, risk sexual behavior in our setting is common, particularly among homosexual men. Most report condom rupture but then nearly half report no condom use despite not knowing

the HIV status of their partner, or even when their partners are HIV-positive. It is necessary to continue campaigning for the use of condoms in recreational sex, and in favor of more resistant material that does not diminish the sensations associated with sexual intercourse^{43,44}. The health care system must guarantee ED attendance of patients engaging in risky sexual behavior, but must also place much greater emphasis on prior prevention of such situations, associated with high economic cost and medication-induced adverse effects.

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Demanda al servicio de urgencias de profilaxis para infecciones de transmisión sexual tras prácticas sexuales de riesgo

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Objetivos: Analizar las características de las consultas a urgencias en demanda de profilaxis para las infecciones de transmisión sexual (ITS) tras una práctica sexual de riesgo.

Método: Durante 6 meses se han revisado las demandas de profilaxis atendidas en el servicio de urgencias tras una práctica sexual de riesgo. Se utilizaron como variables datos epidemiológicos, tipo de práctica, motivo de consulta, tratamiento profiláctico y coste económico.

Resultados: Se han incluido 189 pacientes con una edad media de 32,5 (8,3) años. De ellos, 162 eran hombres (85,7%). El 67,2% eran españoles. Ciento trece casos (59,8%) eran hombres que tuvieron sexo con otros hombres (HSH), con pareja VIH positiva (30,7%) o de estatus serológico desconocido (61,9%). Usaron preservativo el 49,7% de pacientes, pero consultaron por su rotura o pérdida el 45,5%. La penetración anal, activa o pasiva, fue la práctica sexual más frecuente (53,4%). El 85,2% recibió tratamiento profiláctico para el VIH con antirretrovirales durante 28 días, el 77,2% recibió también profilaxis antibiótica para otras ITS y un 22,8% inició inmunización para virus hepatotropos. El coste medio de la visita y de la profilaxis administrada o prescrita en urgencias fue de 858 (275) euros por paciente.

Conclusiones: La práctica sexual de riesgo como motivo de consulta a urgencias es frecuente, principalmente entre un hombre que practica sexo con otro hombre. La mayoría de pacientes acude por una rotura del preservativo, pero casi la mitad no lo usan a pesar de desconocer el estado serológico de la pareja o ser ésta portadora del VIH. La consulta a urgencias y el tratamiento farmacológico generan un coste económico elevado. [Emergencias 2013;25:437-444]

Palabras clave: Práctica sexual de riesgo. Infecciones de transmisión sexual. Prevención. Profilaxis. Gasto sanitario.