

Prevalence of Sexually Transmitted Diseases and Hepatitis C in a Survey of Female Sex Workers in the North-East of Italy

Monica Zermiani^{*,1}, Carlo Mengoli², Claudia Rimondo¹, Umberto Galvan¹, Mario Cruciani¹ and Giovanni Serpelloni¹

¹Center of Preventive Medicine and HIV Screening Center, ULSS 20 Verona, Italy

²Department of Histology, Microbiology, and Medical Biotechnology, University of Padua, Padua, Italy

Abstract: A key issue in the prevention and control of Sexually Transmitted Diseases (STD) is to provide access to health centres, and in diagnosing and treating STD. The present study is aimed to assess the prevalence of sexually transmitted diseases (STDs) and Hepatitis C virus (HCV) in a population of immigrant female sex workers (FSWs). We conducted a cross sectional survey of FSWs working in Verona, North-eastern Italy. Screening test included serology for STDs [including Human Immunodeficiency Virus (HIV), syphilis and Hepatitis B virus (HBV)] and hepatitis C virus (HCV).

Sixteen out of 345 (4.6%) street FSWs screened during 1999-2007 resulted positive for HIV, 12 (3.5%) were positive for HBsAg, 7 (2.0%) were positive for syphilis serological test, and 3 (0.9%) were positive for HCV. Comparison of the prevalence data between women from Africa (286/345, 82.8%) and other countries showed no statistical difference for HIV infection (R.R. 1.44; 95% CI, 0.34-6.19) and for presence of HBsAg (R.R. 2.27; 95% CI, 0.30-17.24). The positivity of syphilis serologic tests had a lower prevalence among African FSWs (mostly coming from Nigeria) than among FSWs from Eastern Europe (57/345, 16.5%). This difference was statistically significant (R.R. 0.03; 95% CI, 0.00-0.28). The prevalence of HIV infection increased with age ($p=0.04$, by χ^2 for trend analysis), but not with the time worked as sex workers in Italy. Moreover, the presence of any of the screened infections was predictable by both age and earlier time of immigration by way of logistic multivariable regression.

The prevalence of HIV and HBsAg was higher in the whole analyzed cohort compared to the general population; prevalence of syphilis was significantly higher in FSWs from Eastern Europe than in FSWs from Africa. HCV prevalence remains low among non intravenous drug abuser FSWs. The data offers a starting point to address targeted intervention that would prevent FSWs acquiring and transmitting STDs.

Keywords: Prostitution, sexually transmitted diseases, HIV.

PURPOSE

In the past few years in Italy, the number of migrant men and women carrying out prostitution activities has increased, especially in the northern regions of the country [1]. Migrant prostitution has become an urgent problem because of their number, which is increasing in proportion to clandestine immigrants coming from Eastern Europe and Africa [2].

A key issue in the prevention and control of Sexually Transmitted Diseases (STD) is to provide access to health centres, and in diagnosing and treating STD as a means of preventing the spread of HIV and other pathologies. Implementing these activities implies an understanding of the prevalence of infections and the behaviours related to them, in order to plan appropriate prevention strategies. Sex workers are a marginalised and often criminalised population, making them very difficult to investigate [3-7].

The "Sirio" project deals with female sex workers (FSWs) and their clients. It is intended to establish a contact

with the FSWs target group on a regular basis. The goal is to prevent STDs by the involvement of FSWs in appropriate educational programmes, and to increase awareness about risky behaviour. Through the use of an outreach mobile unit, FSW are contacted and sent to social health services where they are able to obtain social, psychological and medical support. Health professionals contact the FSWs directly and distribute printed prevention materials to them in order to give women information about STD transmission and safe sex, screening and treatment protocols.

Most of the identified women have no health insurance or documentation; they are at high risk of STD acquisition and have very little knowledge of its prevention. Their illegal status and fear of criminal consequences prevent them from attending public health-care facilities. Anonymity, privacy and free treatment are guaranteed to every FSW, regardless if they have any health insurance or not.

Over time, access to public health service has become spontaneous. Therefore, our population of FSWs is made up of both outreach women and women who spontaneously attended our health center. Moreover, since 2003, a cultural mediator is present every week during the counselling activity in order to facilitate and strengthen the relationship between the FSWs and the health service.

*Address correspondence to this author at the Centro di Medicina Preventiva ULSS 20 Via Germania 20, 37136 Verona, Italy; Tel: 0458076276; Fax: 0458622239; E-mail: mzymian@drone.org

This study describes the prevalence of syphilis, HIV, HBV and HCV among immigrant Female Sex Workers attending our center in Verona, Northern Italy.

METHODS

Both pre- and post- psychological counselling was offered to outreach women and those who were spontaneously attending our health centre. The counselling activity took place at times of HIV testing, as psychological preparation for possible treatment. Data on counselling, screening activities and main socio-demographic women's characteristics were collected on an annual basis.

HIV and other tests were performed at an out-patient clinic in Verona. The clinic is a public health structure providing free and anonymous counselling and testing for HIV and STD. Informed consent was obtained from every woman, the study was approved by the Ethical Committee of the surveillance system of the Veneto Region.

A medical check-up included the following tests: HIV, HBV, HCV, syphilis and, when required, a pregnancy test. The serologic tests were for: syphilis, venereal disease research laboratory test (Syfacard-R VDRL, Abbott Murex), treponema pallidum haemagglutination test (TPHA, Serodia®TPPA, Fujirebio Inc, Tokyo, Japan), and immunoenzymatic method, detecting both anti-*Treponema Pallidum* IgG and IgM (Syphilis TP, Architect system, Abbot Diagnostic Division, Germany). We performed an EIA (IgG and IgM) screening test and, in patients with positive screening test, a nontreponemal test (VDRL) in combination with a treponemal test (TPHA). Primary or secondary syphilis was diagnosed in patients with both nontreponemal and treponemal tests positivity and clinical signs of active disease; latent syphilis was diagnosed when nontreponemal and treponemal tests were positive in the absence of symptoms or signs of active syphilis [8].

For HIV-1 and 2, enzyme-linked immunosorbent assay (HIV Ag/Ab Combo, Architect system, Abbot Diagnostic Division, Germany) and confirmation by immunoblotting (New LAV Blot I, Biorad, Marnes-la-Coquette, France); for HBV, HBV surface antigen (HBsAg) and anti-HBV core antigen (HBcAb) (Abbot Diagnostic Division, Germany); for HCV, ELISA test (Abbot Diagnostic Division, Germany) and confirmation by RIBA HCV 3.0 Strip Immunoblot Assay (Decision HCV® plus, Biorad). Tests for Chlamydia and gonorrhoeae were performed on a clinical basis only when required.

In the presence of serological or clinical evidence of active disease, a treatment was offered. The data presented in this report refers only to the first screening each woman took in the period from 1997 to 2007.

Statistical analysis. To compare proportion, we used Fisher's exact test and the X^2 test for trend with double-sides p-values. The variables initially taken into account belonging to the two groups: demographic-behavioral (African origin, method of recruitment in the survey, Italian language capability, age, year of immigration) and specific infections-dealing (HIV, HBV, HCV, syphilis). Method of recruitment was spontaneous enrolment or by outreach mobile unit. Among the analyzed variables, "age" and "year of immigration" were continuous, and the remaining variables

were binary. Moreover, "infection" was defined where HIV = 1 and/or HBsAg = 1 and/or HBcAb = 1 and/or HCV = 1 and/or TPHA (syphilis treponemal antibody) = 1, where "1" was a positive, "0" was a negative finding.

A logistic regression, multivariable model was performed using "infection" as the dependent variable and demographic/behavior-related explanatory covariates.

All the calculations were performed using STATA version 10.

RESULTS

During 1999-2007, 345 FSWs were tested for STDs. Their mean age (SD) was 24.0 (4.0). The number examined per year was variable: 6 women in 1999, 25 in 2000, 30 in 2001, 14 in 2002, 49 in 2003, 46 in 2004, 80 in 2005, 48 in 2006 and 47 in 2007. The nation of origin was Africa for 286 women (82.6% of the total population coming from Nigeria), Eastern Europe for 57 (16.5%), and South America for 2 (0.5%). The mean age was 24.3 (SD 3.8) years old for African FSW, 22.4 (SD 4.8) years old for those from Eastern Europe and 24.7 (SD 1.6) years old from South American FSW.

The prostitution period (referred period of selling sex) was < 1 year in 106 women (30.7%), > 1 year in 77 (22.3%), > 2 years in 101 (26.4%), while 61 (17.6%) provided no information.

Sexual activity was the risk factor in the whole population, and only one woman (eventually found to be HIV and HCV positive), reported a drug addiction problem in addition to sexual risk. All the interviewed women confirmed that they had never previously been screened for HIV and other STDs in Italy.

At screening test, 4.6% of the subjects were positive for HIV, 2.0% for Syphilis, 0.9% for HCV, 3.5% for HBsAg and 40.6% for HBcAb (Table 1). Based on the results of further virological and immunological tests, antiretroviral treatment was deemed necessary according to former available guidelines [9] and offered to all HIV-positive women with <350 CD4 cells/mm³. Seven out of the 16 HIV positive women are still on ART; the remaining ones dropped out after an average of 1 year. Genotype of resistance were available from 6 of the 7 patients. There were 3 G and 3 CRF02-AG subtypes. Major drug resistance mutations to Nucleoside Reverse Transcriptase Inhibitors (184V and 65R) were detected in 2 subjects. Three out of the 7 women with positive syphilis screening test had both history and serology (VDRL negative), consistent with previously treated episodes of syphilis. One of the 4 remaining women had evidence of active disease and 3 had latent infections: all of them were given penicillin treatment.

Comparison of prevalence data between women from Africa and women from other countries showed no statistical difference for HIV infection (R.R. 1.44; 95% CI, 0.34-6.19). Though HBsAg was detected almost exclusively in African women (11/12), this difference was not statistically significant (R.R. 2.27; 95% CI, 0.30-17.24). However, the positivity of syphilis serologic tests had a lower prevalence among African FSW than those from Eastern Europe: a difference that was statistically significant (R.R. 0.03; 95% CI, 0.00-0.28; p=0.0001). The prevalence of HIV infection

Table 1. Age, Country of Origin and Prostitution Duration in the Examined Cohort According to HIV, HCV, Syphilis and HBsAg+ Status

	HIV		HCV		Syphilis		HBsAg+		Total Number Tested
	Positive		Positive		Positive		Positive		
	N	%	N	%	N	%	N	%	N
Age									
< 18	0	0.00%	0	0.00%	0	0.00%	0	0.00%	9
18-20	0	0.00%	0	0.00%	1	3.13%	2	6.25%	32
20-22	2	2.90%	0	0.00%	2	2.90%	3	4.35%	69
22-24	1	1.20%	0	0.00%	1	1.20%	1	1.20%	83
> 24	13	8.55%	3	1.97%	3	1.97%	6	3.95%	152
Overall	16	4.64%	3	0.87%	7*	2.03%	12	3.48%	345
Nation of Origin									
Africa	14	4.90%	1	0.35%	1	0.35%	11	3.85%	286
South America	0	0.00%	0	0.00%	0	0.00%	0	0.00%	2
Eastern Europe	2	3.51%	2	3.51%	6	10.53%	1	1.75%	57
Overall	16	4.64%	3	0.87%	7	2.03%	12	3.48%	345
Prostitution Duration									
≤ 1 year	3	2.83%	1	0.94%	6	5.66%	1	0.94%	106
≤ 2 year	4	5.19%	0	0.00%	0	0.00%	4	5.19%	77
> 2 year	7	6.93%	1	0.99%	0	0.00%	5	4.95%	101
Not reported	2	3.28%	1	1.64%	1	1.64%	2	3.28%	61
Overall	16	4.64%	3	0.87%	7	2.03%	12	3.48%	345

*3/7 women with positive syphilis screening test had both history and serology (VDRL negative) consistent with previously treated episodes of syphilis; 1 had evidence of active disease and 3 had latent infections.

increased with age (X^2 for the linear trend 6.71, $p=0.009$), but not with the year of immigration (X^2 for the linear trend 2.028, $p=0.15$).

The results of multivariable analysis are shown in Table 2. In this model, the dependant variable was “infection”, defined as the presence of any of the screened infections. The model shows that two covariates reached statistical significance, “age” and “year of immigration”. The negative correlation between “infection” and “year of immigration” means a positive correlation of the dependent variable and an early time of immigration. As for HIV in the bivariate analysis, “infection” appears positively related to age.

Table 2. Logistic Multiple Regression Analysis Using “Infection” as Dependant Variable

Infection	Odds Ratio	Std. Err.	z	P>z	95% Conf. Interval	
Immigration year	0.88	0.05	-2.41	0.016	0.79	0.98
Age	1.07	0.03	2.43	0.015	1.01	1.14

A preliminary stepwise elimination of the covariates with p -value>0.2 was performed. Only the remaining significant explanatory variables were included in the final model. Number of observations: 338. Log likelihood = -215.221. LR $\chi^2(2) = 10.48$, $P = 0.0053$.

The coefficients of the multivariable analysis are reported as ORs. A more recent immigration year of one unit

multiplies the odds of infection by 0.88 (thus reducing the corresponding probability by 12%). Moreover, an age increasing by one year multiplies the risk 1.07% (thus increasing the risk by 7%). Therefore, aged FSWs of less recent immigration are charged with a higher burden of infection.

DISCUSSION

In the cohort of screened FSWs, a 4.6% prevalence of HIV infection, and a 2.0% prevalence of syphilis was found. Prevalence of HIV infection in Italy was 0.4% in the adult general population (UNAIDS/WHO 2008 data) [10].

As far as HBV is concerned, 40.6% of the examined population had had previous episodes of HBV infection, as demonstrated by the presence of anti-HBc, and 3.5% had HBs antigen, a marker of contagiousness. These rates are higher than in the general population, where several surveys conducted in the 1990s-2000s in different Italian areas repeatedly found HBsAg prevalence to be <2% and anti-HBc prevalence <20% [11].

Prevalence of HCV antibodies was as low as 0.9%, lower than in the general population in Italy, a hyper-endemic area where the prevalence of HCV was estimated at ~ 4% [12]. The low prevalence of HCV reflects the low prevalence of drug addiction (1/345) in the analyzed cohort [13, 14].

In our study, we used HBsAg as a marker of HBV contagiousness: the overall prevalence of HBsAg was 3.5%, which did not significantly differ in women from Africa compared to those from Eastern Europe. Looking at the prevalence of HBV markers among FSWs from the available literature, there was inconsistency in data reporting and variability in estimated prevalence [15]. Data from a study in Austria showed prevalence of HBV markers in 44% of illegal FSWs, a rate that is very close to the 40.6% prevalence of anti-HBc in our cohort [16]. In the Austrian cohort, risk factors for HBV were intravenous drug addiction, African origin and irregular condom use. In addition, age, history of sexually transmitted diseases, drug abuse and promiscuity were factors highly related to HBV markers in a study of 80 FSWs in Madrid [17]. In contrast, data from an additional study in Spain among prostitutes from Central and South America, and in Italy among Nigerian prostitutes, showed lower prevalence of HBsAg (0.5- and 0.0%, respectively) screened [13, 18]. However, according to our data and to those from other reports, we believe that screening FSWs for HBV markers (e.g., anti-HBc, anti-HBs, HBsAg) and vaccinating those who are negative would be worthwhile.

Recent surveillance reports from Europe and the United States show an increase of syphilis cases [19, 20]. There is also some evidence that the incidence of syphilis is rising in Italy among men who have sex with men, as well as among heterosexuals [21, 22]. Our data confirm previous data by Smacchia and colleagues [23] with reference to the North-East of Italy: their data showed that rates of syphilis among FSWs from Eastern Europe are higher than those of African origin. Similarly, Prestileo and colleagues [18] reported no cases of syphilis among 109 Nigerian FSWs in Sicily. Most of the FSWs in our cohort were from Nigeria, and a low prevalence of syphilis is a widely observed phenomenon in West Africa [24-26].

A number of limitations need to be acknowledged, since the sample of 345 women in 8 years of data collection is relatively small. However, this limit in sampling is common in epidemiological studies among FSWs, since this kind of population is very difficult to reach [15]. Different languages and cultures are additional aspects that must be taken into account. Indeed, different languages represented a barrier for mutual understanding in 251 interventions (72.7%), such that both counselling activities and the risk of bias in data collection were deeply influenced in this study. Therefore, specific tools are required for this population in order to implement and improve screening and counselling activities. Finally, the population we enrolled is a convenience sample, and some selection bias might have occurred. To examine the extent of selection bias evoked by the recruitment method, the question was addressed by comparing results in participants spontaneously presenting at our center with those recruited by the outreach mobile unit. To this end, it is noteworthy that- in both the bivariate and the multivariable analysis- enrolment methods neither influenced the outcome "infection"- nor showed any correlation with the other covariates analyzed.

Accurate epidemiological information about the distribution of STDs is important for targeting screening and intervention programmes. Both the high prevalence of HIV

and HBsAg in the whole analyzed cohort and the high prevalence of syphilis in FSWs from Eastern Europe should be taken into account.

Language and cultural barriers, as well as immigration concerns among illegal immigrants, form barriers to healthcare access. For conducting this study, we use an outreach mobile unit and we offered anonymity, privacy and free treatment to every FSW, in order to overcome the reluctance in attending public health-care facilities.

As the immigrant population in Italy grows and the country becomes more racially and ethnically diverse, health issues more prevalent among immigrants will perhaps gain more attention. Consequently, there may be a greater emphasis on prevention and treatment of diseases among the immigrant population, including FSWs. Therefore, national and regional health authorities are expected to focus more efforts on policies and programs aimed at addressing access to quality health care services, and to increase the awareness of racial and ethnic disparities amongst the general public and health care providers.

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COMPETING INTERESTS

The authors declare that they have no competing interests.

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