

HIV Frequency Among Female Sex Workers in Imbituba, Santa Catarina, Brazil

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We examined HIV frequency and probable risk factors among female sex workers in the port city of Imbituba, Southern Brazil. From December 2003 through February 2004, 90 female sex workers were interviewed in order to investigate demographic, socioeconomic and behavioral variables related to HIV infection. A blood sample of each woman was also collected to test for HIV antibodies. Six (6.7%) of the sex workers were HIV-positive; the significantly-correlated risk factors were the daily number of clients ($p = 0.008$), the use of inhaled illicit drugs by the sex workers ($P = 0.053$) and by their clients ($p = 0.005$), and the lack of condom use in sexual relations ($p = 0.015$). The HIV infection rate in these sex workers was higher than that in the general population and similar to that found in other studies made with Brazilian populations presenting the same characteristics. This highlights the need for preventative measures, especially in this port area, in order to reduce transmission and to deter the introduction and dissemination of HIV.

Key Words: HIV, prostitution, risk behavior.

Sexually-transmitted diseases (STDs), including AIDS, are a serious public health problem, due to the great number of notifications, the increasing proliferation of the illness, and the social and economic impact on the afflicted countries [1,2]. AIDS has spread worldwide as an STD, and it is currently prevalent among heterosexuals [3]; it is a threat to female sex workers since they are at great risk both for contracting and disseminating HIV [4]. The large number of sexual partners, together with the difficulty in negotiating safe sex with the use of condoms, and the difficulty of adhesion to prevention measures, make this group of women more vulnerable to HIV infection [5]. Female sex workers are generally more vulnerable to STDs, and they contribute to the growth of the HIV epidemic [6,7].

We chose the port city of Imbituba, in the state of Santa Catarina, in Southern Brazil, since no

epidemiological HIV inquiry had been performed so far in this region. Our objective was to provide relevant data for the planning of interventions and for the implementation of new preventive actions in public health.

Material and Methods

From December 2003 through February 2004, with the help of a non-governmental organization called the Industry of Solidarity (ISO), we contacted 135 female sex workers in the port area of Imbituba, Santa Catarina. However, only 90 were both eligible and agreed to participate. To be eligible for this study the subject had to be a female sex worker, 18 years old or older, working in the port area of Imbituba. Exclusion criteria included being younger than 18, not working as a sex professional, as well as refusing to participate in any of the phases of the study, which included taking blood samples and answering a questionnaire.

The inquiry consisted of a descriptive cross-sectional epidemic study. All of the volunteers signed an informed consent form. A blood sample was collected for detection of HIV antibodies. Face-to-face interviews

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were performed with all participants to gather information about their characteristics, as well as to identify their sexual practices and at risk behavior for contamination by HIV. The anti-HIV tests were carried out at the Clinical Analysis Laboratory of Unisul (Universidade do Sul de Santa Catarina); the Abbott® HIV kit using the MEIA method in *AxSYM System* automation was engaged to test for HIV. A second immunoassay, the Roche® HIV kit using ELISA in *Cobas Core* automation, was applied when necessary. Undetermined or positive results for HIV were confirmed using IFI or WB techniques as confirmatory tests for HIV, which are procedures determined by the bylaws of the Brazilian Ministry of Health. When undetermined or positive results for HIV occurred during the trial stage, a second blood sample was collected to comply with such bylaws. The confirmatory tests were made at the Central Laboratory of Public Health (LACEN) in Florianópolis, the state capital of Santa Catarina.

Based on the interviews and the laboratory results, a database was created with the use of Excel. The Statistical Package for Social Sciences software was engaged for the analyses of the research data. The Chi-square test was applied to qualitative variables and the Levene and the Kolmogorov-Smirnov tests for the quantitative variables. Parametric (T-test) and non-parametric (Mann-Whitney U-test) tests were applied to determine whether there were differences among the behavioral variables in the comparison between women with and without HIV.

Results

Out of the 90 female sex workers who participated in this study, six (6.7%) were found to be HIV-positive. The female sex workers who worked in this area performed their prostitution activities in commercial establishments, such as bars and nightclubs, as well as in the streets. Their clients had various backgrounds, including truck drivers, dockworkers, sailors, tourists, and members of the local population.

The participants of this study were mostly young, mean age of 27 years, ranging from 18 to 60, with a

standard deviation of ± 5.2 years. Most were white, had children (most of whom had been or were being breastfed), had a low education level (incomplete elementary school), and belonged to a low socioeconomic class (predominantly class D, according to the criterion in Brazil, Table 1).

Among the sexual practices and risk behaviors, significant associations were found between HIV infection and the number of clients attended per day ($p=0.008$), sexual relations without frequent use of condoms ($p=0.015$), and the use of inhaled illicit drugs ($p=0.053$, Table 2).

Discussion

The STDs were minimized with the introduction of antibiotic therapy, and unwanted pregnancy has diminished with the use of various contraceptive methods. However, the appearance of HIV and AIDS has brought a new wave of unrest and concern, affecting especially those who commercialize their bodies working as sex professionals. With the advancement of the AIDS epidemic, sexual practices have become an important form of transmission of the infection, and sex workers are at risk, both to acquire and to disseminate the virus.

We found that HIV had infected six out of the 90 women interviewed in this study, which corresponds to a seroprevalence rate of 6.7%. This seroprevalence rate is similar to those found in other studies with sex workers in Brazil, such as the one carried out in Paranaguá, PR, in 1993, which reported a rate of 4.5% HIV infection among 132 women [8]. A similar study performed by the HIV/AIDS reference center in Vitória, ES, in 1998, revealed an infection rate of 8.6% among 140 women [9]. Another study conducted among street sex workers in Santos, SP, in 1990, presented an infection rate of 11.1% [10]. Many of the female sex workers who participated in this study did not live permanently in the area; 36.7% were transitory workers in the region, which shows that this population is in constant movement from one city to another. Since they do not have a fixed residence, they

Table 1. Demographic and socioeconomic characteristics of female sex workers surveyed in Imbituba, SC, from December 2003 through February 2004

Characteristics	Anti-HIV		N	%	P
	Negative	Positive			
Age					
≤ 25.5	41	3	44	48.9	0.955
> 25.5	43	3	46	51.1	
Place of birth					
Santa Catarina	35	3	38	42.2	0.763
Rio Grande do Sul	13	1	14	15.6	
Paraná	30	1	31	34.4	
Other Brazilian States	6	1	7	7.8	
Race					
White	74	3	77	85.6	0.001
Black	2	2	4	4.4	
Mulatto	8	1	9	10.0	
Children					
Yes	71	5	76	84.4	0.938
No	13	1	14	15.6	
Breastfeeding					
Yes	61	5	66	86.8	0.368
No	10	0	10	13.2	
Socioeconomic class*					
B1	2	0	2	2.2	0.386
B2	1	0	1	1.1	
C	24	1	25	27.8	
D	43	2	45	50.0	
E	14	3	17	18.9	
Education background					
Illiterate	4	0	4	4.4	0.721
Elementary School (incomplete)	52	5	57	63.4	
Elementary School	10	1	11	12.2	
Secondary School (incomplete)	15	0	15	16.7	
Secondary School	3	0	3	3.3	
Steady partner					
Yes	45	2	47	52.2	0.338
No	39	4	43	47.8	

* The Brazilian Economic Classification Criterion categorizes the economic classes (A1, A2, B1, B2, C, D, and E) based on the family's income combining the purchase power with the educational background (E is poorest).

Table 2. Sexual practices and risk behavior among female sex workers surveyed from December 2003 through February 2004, in Imbituba, SC

Characteristics	Anti-HIV		N	%	P
	Negative	Positive			
Duration of prostitution (years)					
≤ 2.5	40	2	42	46.7	0.498
> 2.5	44	4	48	53.3	
Number of clients per day					
≤ 1	30	1	31	34.4	0.008
> 1 and < 4	41	1	42	46.7	
≥ 4	13	4	17	18.9	
Sexual practice					
Vaginal	28	2	30	33.3	0.985
Vaginal and oral	41	3	44	48.9	
Vaginal, oral, and anal	13	1	14	15.6	
Vaginal and anal	2	0	2	2.2	
Sex during menses					
No	49	5	54	60.0	0.395
Yes	18	1	19	21.1	
Sometimes	17	0	17	18.9	
Condom use					
Always	15	0	15	16.6	0.015
Sometimes	64	6	70	77.8	
Never	5	0	5	5.6	
Previous reported STDs					
No	38	2	40	44.4	0.571
Yes	46	4	50	55.6	
Drug use					
No	6	0	6	6.7	0.005
Yes, licit ones	37	0	37	41.1	
Yes, inhaled illicit	40	6	46	51.1	
Yes, injected illicit	1	0	1	1.1	
Blood transfusion					
No	73	6	79	87.8	0.344
Yes	11	0	11	12.2	

migrate frequently to other port cities, such as Itajaí, São Francisco do Sul, and Paranaguá. Moreover, even those who informed that they had a fixed residence in Imbituba said that they also worked in other prostitution areas, mainly in Tubarão, Florianópolis, and Balneário

Camboriú, all in the state of Santa Catarina. Occasionally, they return to their home cities, especially when few ships are at the docks.

Dissemination of HIV infection to other regions can occur through the port, which receives ships from different

parts of the world, and through the BR101 highway, which links the north and the south regions of Brazil and continues to other countries that comprise the Mercosul. These professionals have sexual relations with truck drivers who drive along the BR101 highway, as well as with sailors. During summer, there are tourists from other regions of the state, as well as from the states of Paraná, São Paulo, and Rio Grande do Sul, as well as some coming from Uruguay, Paraguay, and Argentina. In this environment, the sex workers are an important link in the chain of the HIV contamination and transmission process.

Most of the women had children; some were multiparous. Breastfeeding was a common practice, during a mean period of eight months. This information is relevant for the risk of vertical HIV transmission among this population. With increases in numbers of infected women, the risk of vertical infection raises accordingly, generating higher rates of child mortality and leading to higher expenditures in public health with a preventable disease [11].

In the socioeconomic classification, 50% of the participants belonged to class D, which is less than two minimum wages (approximately 240 U.S. dollars) in monthly earnings, according to the Brazilian criterion. As they are constantly moving from place to place, these sex workers have a life style that does not lead to the creation of family bonds or to the accumulation of assets. Furthermore, they had a low education level (63% had not completed elementary school). Studies performed in Brazil and in other countries pointed out that poverty and little schooling constitute common characteristics among the sex workers groups. For example, a study carried out in 1989, in Chile [12], revealed that more than half of the 100 sex workers studied had achieved only elementary school level, leading to a assumption that low education level leads to a greater difficulty to understand the HIV transmission chain and to adopt preventative health measures and hygiene practices.

In the examination of sexual practices and risk behavior, a significant association was observed between HIV infection and the number of clients per day, the lack of condom use in sexual relations, and the use of inhaled illicit drugs. These associations were

also demonstrated in a similar study by Carter *et al.*, in Georgetown, Guyana, in 1997, who found a seroprevalence of 25% of HIV infection in a sample of 108 sex workers; associations were found with sexual relations without the use of condom, the use of illegal drugs such as cocaine, and more than five clients per week [13]. In another survey carried out in 1995 with 26 street sex workers in Venezuela, in which the seroprevalence was 3.6%, a significant association between HIV infection and sexual relations without the use of condom was also pointed out [14].

We found a positive correlation between HIV infection and the attendance of four or more clients per day. Nowadays, it is known that women are biologically more vulnerable to HIV [3]. The surface of the vaginal mucosa is ample, which provides a greater exposure to the semen, in which the concentration of viruses is significantly higher than in vaginal secretions. Moreover, STDs are more frequently asymptomatic in women than in men, causing micro-injuries and local inflammations, thus weakening the natural defense barriers. Consequently, a larger number of partners in sexual relations implies in an increase in the risk of infection by the HIV [15].

The use of injected drugs was not a common practice, at least as reported by the interviewees. However, when blood samples were taken, some marks of needles were observed in their arms; but when asked about the use of injected drugs they promptly denied it. On the other hand, the consumption of licit drugs and inhaled illicit ones was a common practice among the participants, which obviously alters their perception of the reality to be faced day-by-day. The consumption of alcohol and the use of drugs provokes physiological, psychic, and emotional alterations, increasing the exposure to risks and unprotected sex practices. Some sex workers reported that although their clients normally begin intercourse with the use of condoms, they sometimes remove it during the sexual act, without the woman noticing it, which increases the risk of HIV infection.

We assume that the HIV infection occurred predominantly via vaginal penetration, since only one out of the six infected women reported having practiced anal sex, and none of them reported either to have used

injected illicit drugs or to have had a previous blood transfusion.

Among the limitations of our study, we can include the dangerous and unsafe places visited by the researchers and the lack of receptivity by some sex workers or their pimps, which prevented us from taking blood samples or conducting interviews. It was very difficult, and sometimes impossible, to meet the sex workers at their work places for the interviews and blood sample collection due to the nature of their life style and their working conditions. The educative and preventive work developed by the non-governmental organization ISO was a facilitating factor for this research; nonetheless, it may have also influenced the answers to the questionnaire to a certain extent.

The lack of condom use in sexual relations, the great number of clients attended daily, and the use of inhaled illicit drugs were risk factors for the infection and transmission of HIV. Preventative work should be continued through government programs or non-governmental organizations in order to develop health education among sex workers and their clientele, since the core problem has not yet been solved.

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