

Hepatitis B among female sex workers in Ribeirão Preto – São Paulo, Brazil

Hepatite B entre mulheres profissionais do sexo em Ribeirão Preto – São Paulo, Brasil

Afonso Dinis Costa Passos¹

José Fernando de Castro Figueiredo²

Ana de Lourdes Candolo Martinelli²

Márcia Guimarães Villanova²

Margarida Pásseri do Nascimento²

Ana Maria Coimbra Gaspar³

Clara Fumiko Tachibana Yoshida³

¹ Department of Social Medicine, Ribeirão Preto Medical School, University of São Paulo, Ribeirão Preto, Brazil

² Department of Internal Medicine, Ribeirão Preto Medical School, University of São Paulo, Ribeirão Preto, Brazil

³ National Reference Laboratory of Viral Hepatitis, Oswaldo Cruz Foundation, Rio de Janeiro, Brazil

Correspondence to: Afonso Dinis Costa Passos, Department of Social Medicine – Ribeirão Medical School – University of São Paulo, Avenida Bandeirantes, 3900 – CEP 14049-900 - Ribeirão Preto, SP, Brazil. Email: apassos@fmrp.usp.br

Abstract

Objective: To estimate the prevalence of hepatitis B markers and to study the risk factors for this disease among female sex workers in the city of Ribeirão Preto, Brazil. **Methods:** A questionnaire was given to 449 female sex workers in order to obtain information about demographic, socioeconomic and behavioral variables. Blood samples were collected and analyzed by immunoenzymatic techniques for detection of HBsAg, anti-HBs, anti-HBc and anti-HCV markers. **Results:** The mean age of participants was 23 years, varying from 13 to 64 years. A high spatial mobility was observed, with 47.9% of participants residing in places out of the region of Ribeirão Preto or in other Brazilian states. Complete absence of previous vaccine against hepatitis B was referred by 98.2%. Overall, the presence of any hepatitis B marker was observed in 106 participants (prevalence of 23.6%; 95% CI: 19.7 – 27.5), with 84 positive for anti-HBs (18.7%), 100 for anti-HBc (22.3%), and only 3 for HBsAg (0.7%). The logistic regression analysis showed association between hepatitis B markers and the following co-variables: residence in Ribeirão Preto, age, low socioeconomic level, consumption of *crack*, intercourse with HIV-infected individuals, history of previous hepatitis, intercourse with a case of hepatitis, and positivity for hepatitis C. **Conclusions:** Ribeirão Preto's female sex workers present several risk factors for hepatitis B and almost absence of previous specific vaccination, making it necessary to emphasize this low-cost preventive measure, preferably through the use of a mobile team, taking the vaccine to their places of work.

Keywords: Hepatitis B; Prevalence; Sex workers; Prostitutes

Resumo

Objetivos. Estimar a prevalência de marcadores de hepatite B e estudar os fatores de risco para esta doença entre mulheres profissionais do sexo na cidade de Ribeirão Preto, Brasil. **Métodos.** Foi aplicado um questionário a 449 mulheres profissionais do sexo, com a finalidade de levantar informações demográficas, socioeconômicas e comportamentais. Amostras de sangue das participantes foram analisadas através de técnicas imunoenzimáticas, para detecção dos marcadores HBsAg, anti-HBs e anti-HBc. **Resultados.** A idade média das participantes foi 23 anos, variando de 13 a 64 anos. Uma elevada mobilidade espacial foi verificada, com 47,9% delas residindo em locais fora da região de Ribeirão Preto ou em outros estados brasileiros. Completa ausência de vacinação prévia contra hepatite B foi referida por 98,2%. No total, observou-se presença de qualquer marcador de hepatite B em 106 participantes (prevalência de 23,6%; IC_{95%}: 19,7 – 27,5), com 84 positivos para anti-HBs (18,7%), 100 para anti-HBc (22,3%) e apenas 3 para HBsAg (0,7%). A análise por regressão logística evidenciou associação entre marcadores de hepatite B e as seguintes co-variáveis: idade, baixo nível socioeconômico, consumo de *crack*, relações sexuais com indivíduos infectados pelo HIV, história de hepatite prévia, relações sexuais com pessoas portadoras de hepatite e positividade para hepatite C. **Conclusões.** As profissionais do sexo em Ribeirão Preto apresentam diversos fatores de risco para hepatite B e quase total ausência de vacinação prévia específica, tornando necessários esforços concentrados na aplicação dessa medida de baixo custo, preferencialmente através do uso de equipes móveis que levem a vacina até os seus locais de trabalho.

Palavras-chave: Hepatite B; Prevalência, Profissionais do Sexo; Prostitutas

Introduction

The first evidence that hepatitis B can be transmitted by the sex route dates back to the early seventies, with the virus being isolated from saliva, semen¹ and vaginal secretions², and being frequently detected in patients seen at clinics of sexually transmitted diseases³. The hypothesis of sexual transmission eventually gained support from investigations involving persons with intensive exposure, such as sex workers⁴ and male homosexuals⁵. However, the marginalization and discrimination which these groups always suffer caused them to receive little attention from investigators in the health area⁶.

The dissemination of the acquired immunodeficiency syndrome (aids), starting in the 1980's, was a crucial fact for sex workers (SW) to start to be investigated more frequently. Because of the similarity of the mechanisms of transmission and, consequently, of the more vulnerable groups, research on aids indirectly provided information about behavioral and biological aspects related to the transmission of hepatitis B. Although the human immunodeficiency virus (HIV) has a much lower infectivity than the hepatitis B virus (HBV)⁷, it is undeniable that its impact on public opinion and on the academic community is considerably more intense. Because of this, investigations involving SW are directed at aids much more than at hepatitis, impairing the knowledge of the epidemiologic situation of the latter in this high-risk population group.

This clearly occurs in Brazil, where information about hepatitis among SWs is quite scarce. This fact can be observed in Ribeirão Preto, a city of about 500,000 inhabitants located in the Southeast region of the country (State of São Paulo), in which, despite the existence of institutions that support SWs, these workers have never been the target of any epidemiologic investigation regarding health aspects in general, and hepatitis in particular.

The objective of the present study was

to estimate the prevalence of hepatitis B markers and to study the risk factors for this disease among female SWs working in Ribeirão Preto.

Methods

With the collaboration of the Municipal Aids Control Program and of the staff of a university institution which provides support to SWs in Ribeirão Preto, the sites where they could be found were identified, as well as their homes and/or places of work. These places were visited by the investigating team, which included a social assistant with extensive experience in work with city SW and a public health physician. The visits to each site were repeated in order to guarantee that all individuals residing or working there could be contacted. When necessary, visits were scheduled in advance in order to facilitate finding and including potential participants. Each site of residence and/or each site for the practice of prostitution identified in the city was visited at least three times in order to guarantee the largest possible number of participants.

Regarding the practice of prostitution in open areas, fixed sites close to the working areas of SWs were first used, with SWs being asked to come to these sites. These activities were complemented with active searches performed on foot or by car, and with the participation of natural leaders identified among potential participants. After this strategy was fully explored, the investigating team started to use an especially adapted bus, which had seats, tables and a large space in the back. This bus allowed for the inclusion of many SW who were reluctant to leave their place of work and to go to a fixed place. Other potential participants were identified and included in the study based on information provided by persons who knew them, using the technique known as snowball sample.

After being informed about the objectives of the investigation, potential participants were given orientation on viral hepa-

titis, stressing the modes of transmission and the prostitution-associated risks. According to the status of hepatitis B vaccination, each participant received one dose of the product and a follow-up visit was scheduled for the following doses. After that, they were invited to sign a free term of consent to participate in the study. A questionnaire was then given in order to obtain demographic and socioeconomic data and risk factors for viral hepatitis, with all interviews being conducted by a social worker who had been working with this population for more than five years. At the same time, a 10 ml blood sample was obtained by venous puncture and a serum sample was sent to the National Reference Laboratory of Viral Hepatitis, where they were submitted to immunoenzymatic tests for the detection of the following markers: HBsAg (Hepanostika® HBsAg Uni-Form II – Organon), anti-HBsAg (Biokit®), total anti-HBcAg (Hepanostika® anti-HBc Uni-Form – Organon), and anti-HCV (UBI HCV EIA® – Organon). Tests were performed and their cut-off points were defined according to manufacturer instructions. Social stratum was defined according to the Brazilian Criterion of Economic Classification used by the National Association of Research Companies⁸. These criteria are based on the following variables: educational level of the head of the family, ownership of some specific household appliances, and presence of a housemaid paid by the participant. Points were attributed to each of these items and the result is expressed in a decreasing numerical classification defining strata: 25 to 34 points (stratum A), 17 to 24 points (stratum B), 11 to 16 points (stratum C), 6 to 10 points (stratum D), and 0 to 5 points (stratum E).

Associations between the qualitative or stratified quantitative variables and the presence of serologic markers for hepatitis B were first determined by the chi-square test. Variables showing a “p” value of 0.25 or less were analyzed by a logistic regression model.

The project was approved by the Medi-

cal Ethics Committee of Ribeirão Preto's Medical School's Hospital. The data for the study were collected from August 1999 to March 2000.

Results

As shown in Table 1, the mean age of participants was 23 years, with a wide range (13 to 64 years). The percentage of prostitutes born in the city of Ribeirão Preto and surrounding region was small, with more than 60% of the subjects originating from other Brazilian states. Less than half of the participants lived in Ribeirão Preto and approximately one third of them maintained a residence in

Table 1 – Social and demographic characteristics of the participants
Tabela 1 – Características sociais e demográficas dos participantes

Characteristic	n	%
Age (years)		
mean	23	
variation	13 – 64	
Place of birth		
Ribeirão Preto	28	6.2
Rib. Preto region	37	8.3
São Paulo State	107	23.8
Other State	277	61.7
Place of residence		
Ribeirão Preto	196	43.6
Rib. Preto region	38	8.5
São Paulo State	64	14.3
Other State	151	33.6
Schooling (years)		
< 2	28	6.2
2 – 4	54	12.0
4 – 8	277	61.7
High school	77	17.2
College	13	2.9
Social category		
A	2	0.5
B	41	9.1
C	168	37.4
D	180	40.1
E	58	12.9
Total	449	100.0

other states. There was a predominance of individuals with 4 to 8 years of schooling, followed by those who started or completed high school, whereas 18.2% had 4 years of schooling or less. The C and D social strata reached 77.5% of participants.

A hepatitis B marker was present in 106 SWs, which accounts for a total prevalence of 23.6% (95% CI: 19.7 – 27.5). HBsAg was detected in only 3 individuals (0.7%), while anti-HBs was present in 84 (18.7%) and anti-HBc in 100 (22.3%) participants. A history of previous vaccination against hepatitis B was referred only by 8 SWs, 5 with 1 dose and 3 with two 2 doses.

Logistic regression analysis (Table 2) showed that the variables associated with the presence of hepatitis B markers were: residing in the city of Ribeirão Preto (against those residing out of the town), age (treated as a continuous variable), belonging to lower economic strata (D+E as compared with A+B+C), use of crack, intercourse with anti-HIV-positive partners, previous hepatitis, intercourse with partners with hepatitis, and a positive serological test for the hepatitis C virus.

Discussion

Being known to the great majority of SWs and having gained their esteem and respect, the social assistant who held the interviews played the role defined in the literature as a “privileged access interviewer”, greatly facilitating the contact and compliance of potential participants⁹. Equally important was the help provided by some SWs, who spontaneously contributed to the recruitment of participants, playing the role of key informers, i.e., individuals from the community, of recognized leadership, and with the potential to influence others to participate or not in the investigation¹⁰. After repeated visits to all areas in the city where SWs might be encountered, and with a refusal rate of less than 5%, there was reasonable certainty that most SWs had been included, resulting in a number of participants higher than the

Table 2 – Multivariate association between hepatitis B serological markers and selected features among female sex workers of Ribeirão Preto, Brazil, 2000.

Table 2 – Associação multivariada entre marcadores sorológicos para hepatite B e características selecionadas entre mulheres profissionais do sexo em Ribeirão Preto, Brasil, 2000

Variable	OR	Confidence interval (95%)	p
Residence in Ribeirão Preto (1 = yes; 0 = no)	1.69	1.03 – 2.78	0.039
Age* (continuous)	1.08	1.04 – 1.12	0.000
Social category (1 = D+E); 0 = A+B+C)	2.11	1.28 – 3.47	0.033
Consumption of crack (1 = yes; 0 = no)	4.07	2.29 – 7.23	0.000
Self-report of sex with an HIV-positive person (1 = yes; 0 = no)	2.74	1.15 – 6.51	0.023
Previous hepatitis (1 = yes; 0 = no)	2.72	1.16 – 6.33	0.021
Self report of sex with a case of hepatitis (1 = yes; 0 = no)	2.32	1.02 – 5.31	0.046
Positive result for hepatitis C (1 = yes; 0 = no)	3.40	1.12 – 10.29	0.030

*increase in risk for every year of life/*risco aumenta para cada ano de vida

400 initially anticipated by the Municipal Aids Control Program. This fact certainly minimized the possibility of selection biases.

It is interesting to note the power the city of Ribeirão Preto has to attract SWs, as demonstrated by the finding that most of the them were born elsewhere and that more than 1/3 of the prostitutes maintain residence in other states of the country, regularly coming and going for the temporary practice of their activities. This high mobility represents a considerable obstacle to the implementation and maintenance of preventive programs, in addition to allowing the introduction of infectious agents in non-infected areas¹¹.

When compared to the population of Ribeirão Preto, participants showed much lower schooling¹² and, when compared to the Brazilian population as a whole, they showed a higher proportion of individuals belonging to the C and D social strata⁸, demonstrating the low socioeconomic level of the population studied.

Only 6 SWs presented anti-HBs as an isolated serologic marker and among them

no one had been vaccinated against hepatitis B. As a consequence, every positive test for this marker can be regarded as result of a previous HBV infection. The possibility of a recall bias was not considered possible, since routine vaccination against hepatitis B started in Brazil only in 1999, covering individuals from birth up to 19 years of age. Considering that data for this investigation were collected from August 1999 to March 2000, it is highly unlikely that a participant would have been vaccinated without remembering it, after such a short period of time.

The prevalence of infection detected among Ribeirão Preto female SWs proved to be lower than those reported in different parts of the world, such as China¹³, Peru¹⁴, Malaysia¹⁵, Greece¹⁶, and Somalia¹⁷. On the other hand, reduced prevalences similar to those obtained in Ribeirão Preto have been reported in studies conducted in Mexico, in which the possible explanations for the results included the absence of use of illegal injecting drugs, the infrequent practice of anal sex, the use of condoms, and the relative rarity of infec-

tion in the general population^{18,19}. It is possible that some of these factors also contributed to the low occurrence of markers among prostitutes from Ribeirão Preto, where users of illegal injecting drugs were practically non-existent and the use of condoms in commercial sexual relations was generalized¹¹.

The finding that residing in Ribeirão Preto is an independent risk factor for hepatitis B is intriguing and has no reasonable explanation since it is not due to differences in age, time of exposure, social stratum or use of drugs, factors that were all controlled for in the logistic regression analysis. Conversely, the strong association with crack consumption is linked to characteristics typical of the use of this drug. Crack tends to be consumed indistinctly by both genders^{20,21} and has a high power to produce severe addiction^{20,22}. This condition causes SWs to be vulnerable, being often forced to reduce their prices and to increase the number of clients, in addition to subjecting themselves to high-risk sexual practices demanded by their partners²². The percentage of use of this drug was 16.9% among Ribeirão Preto SWs¹¹ and the strong association observed in the present study fully agrees with almost all references in the literature, which are practically unanimous in considering the use of crack as one of the most important predictors of HBV and HIV infection^{20,22,23}.

Current or previous use of illegal injecting drugs was reported by only 16 female SWs (3.5%)¹¹. Although the possibility of false negative responses cannot be completely ruled out, the relationship of acquaintance and familiarity of the interviewer with the participants leads us to believe that, if they occurred, their number was negligible. This finding is in contrast to some reports of high consumption of injecting drugs by SWs at some time in life, with values above 50% among prostitutes in the United States of America²⁴. Since the use of these drugs has been widely recognized as a risk factor for HBV,

as well as HIV infection²⁴⁻²⁶, their rare consumption in Ribeirão Preto must have been responsible for the finding of no association in the present study.

The similar mechanisms of HBV and HIV transmission justify the association between self-report of intercourse with an HIV-positive and hepatitis B positive persons. The potential fragility of this information, however, should be recognized, since an occasional sexual partner is generally not aware of the HIV-positive condition of his/her partner.

The association with age must reflect a cumulative effect of behavioral risks and the association with a history of intercourses with hepatitis patients confirms the high potential of HBV for transmission by this route, a fact that has been long known^{4,5}. This may explain, at least in part, the association observed between HBV markers and a previous history of hepatitis.

Underprivileged socioeconomic conditions favor the transmission of HBV as a consequence of the more frequent adoption of risky sexual practices, such as a lower use of condoms²⁷, a longer duration of the workday, and a larger number of partners²⁸. Furthermore, socioeconomic difficulties are one of the leading drivers determining the early beginning of prostitution²⁹, sometimes defined as *survival sex*³⁰. In addition, in many cases, prostitutes come from socially maladjusted families in which sexual abuse in childhood and adolescence represents a tragic reality³⁰.

Positive serologic results for hepatitis C (HCV) was observed for 17 prostitutes (3.8%; IC_{95%}: 2.0 – 5.6) with no relation to the use of illegal injecting drugs. The possibility of transmission by the sexual route, in addition to the parenteral route causes simultaneous infection with HBV and HCV to be a predictable event.

The epidemiological findings in this population represent a contribution to the knowledge of hepatitis B among SWs in Ribeirão Preto. Their generalization to other similar cities in the country may be

possible, but it has to be confirmed by further investigation.

Despite the relatively low prevalence of hepatitis B markers in female SWs in Ribeirão Preto, the presence of several different risk factors¹¹, along with the virtual absence of vaccine coverage, confirms the need for implementing intervention measures, based on the massive use of the specific vaccine. Although SWs are eligible to receive this product, it is unrealistic to expect them to visit healthcare units in order

to get it. Considering this, one possible approach is to have a mobile team to vaccinate SWs in their places of work, as was the case all along the execution of this investigation. Nevertheless, it must be emphasized that the fight against hepatitis B should also be integrated at the primary health care level, along with AIDS and other STD prevention activities.

We declare no conflict of interest

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