

Angela Mattos Marchesini<sup>1</sup>

Zilá Prestes Prá-Baldi<sup>1</sup>

Fábio Mesquita<sup>II</sup>

Regina Bueno<sup>II</sup>

Cássia Maria Buchalla<sup>III</sup>

# Hepatitis B and C among injecting drug users living with HIV in São Paulo, Brazil

---

## ABSTRACT

**OBJECTIVE:** To describe the profile of injecting drug users living with HIV/AIDS and estimate hepatitis B and hepatitis C prevalence rates within this group.

**METHODS:** Cross-sectional study conducted with 205 injecting drug users living with HIV/AIDS receiving attention in three public health clinics in the city of Sao Paulo, in 2003. A non-probabilistic sample of volunteers was selected consecutively on the days respondents appeared for their appointments at the clinics. Personal data and information on sexual behavior, drug use and knowledge of hepatitis was collected through interviews. Tests were conducted to detect infections of the hepatitis B and C viruses.

**RESULTS:** Out of the interviewees, 81% were men and 19% women, with an average age of 39 (SD = 6.1) and six years of formal education (SD = 2.0). There was no difference in marital status between the sexes, of which 48% were single, 42% were married, and 8% were divorced. The average ages for first use of tobacco, alcohol and illegal drugs were 13, 15 and 18, respectively. Hepatitis B and C prevalence were 55% (95% CI: 49;63) and 83%(95% CI: 78;88), respectively. Eighty percent of respondents had not heard of Hepatitis B and C prior to the first time they used injecting drugs.

**CONCLUSIONS:** The high prevalence rates of Hepatitis B and C and low level of knowledge regarding the diseases justify the inclusion of information about hepatitis infections and the hepatitis B vaccines in HIV harm reduction strategies.

**KEY WORDS:** Hepatitis C, epidemiology. Hepatite C, prevention & control. Hepatitis B, epidemiology. Hepatitis B prevention & control. HIV infections, epidemiology. Substance abuse, Intravenous. Cross-sectional studies.

---

## INTRODUCTION

The World Health Organization estimates that 170 million people are infected with the hepatitis C (HCV) virus and that 300 million live with hepatitis B (HBV).\*

In Brazil, there are records of hepatitis B and C prevalence rates by region, yet there are no studies indicating the national prevalence rate of these infections.\*\* In a population-based study conducted in São Paulo, prevalence rates of 1% to 4% for HCV and 1% for HBV were recorded.<sup>4</sup>

<sup>1</sup> Centro de Referência de DST/AIDS Nossa Senhora do Ó. Secretaria Municipal de Saúde. São Paulo, SP, Brasil

<sup>II</sup> Secretaria Municipal de Saúde. São Paulo, SP, Brasil

<sup>III</sup> Departamento de Epidemiologia. Faculdade de Saúde Pública. Universidade de São Paulo. São Paulo, SP, Brasil

### Correspondence:

Angela Mattos Marchesini  
Centro de Referência de DST/AIDS Nossa Senhora do Ó  
Av. Itaberaba, 1377  
02734-000 São Paulo, SP, Brasil  
E-mail: angela.marchesini@terra.com.br

Received: 8/8/2006  
Reviewed: 5/31/2007  
Approved: 6/3/2007

---

\* World Health Organization. Hepatitis C – Revised October 2000. Geneva; 2000 [Accessed on: 8/5/2007]. (Fact Sheet, 164). Available at: <http://www.who.int/mediacentre/factsheets/fs164/en/index.html>

\*\* Ministério da Saúde. Hepatites. Situação atual da doença. Brasília (DF): 2007 [Accessed on: 8/5/2007]. Available at: [http://portal.saude.gov.br/potal/saude/visualizar\\_texto.cfm?idtxt=22248](http://portal.saude.gov.br/potal/saude/visualizar_texto.cfm?idtxt=22248)

A prevalence study of hepatitis B and C among injecting drug users (IDUs) in the city of Santos, found that 75% of those who were interviewed were carriers of both infections,<sup>2</sup> due in large part to sharing syringes and needles.

The fact that the hepatitis C and acquired immunodeficiency (HIV) viruses are transmitted through blood increases the chances of IDUs presenting this co-infection. This group has a higher risk of simultaneously presenting, HBV, HCV and HIV infections.

In research conducted in São Paulo with patients who carry the HIV virus, a prevalence rate of 38.6% for hepatitis B (using a test for the total antibodies anti-HBc total and of 17.7% of anti-HCV).<sup>7,8</sup> In another study, in Belem in Para, prevalence rates of 51% and 16% were found for hepatitis B and C, respectively.\* Contrary to what has occurred in other opportunistic infections, an increase in the incidence of chronic complications resulting from hepatitis in people living with HIV has been observed.<sup>2,\*\*</sup> A cohort study conducted among AIDS cases diagnosed from 1995 on, found a prevalence rate of 33% for hepatitis C.<sup>6</sup> Another study among IDUs in Santos found high prevalence rates of hepatitis C among IDUs: 84.8% and 20.9% among non IDUs. This indicates that exposure to blood and sexual relations with IDUs are the main risk factors for HCV transmission among HIV positive patients.<sup>9</sup>

In *Project Brasil*, \*\*\* conducted with the IDU population in some Brazilian cities, HBV prevalence rates of 7.8% (for the antigen HBsAg); 55.8% for HBV (anti-HBc); and 69.6% for HCV, were found in the city of Rio de Janeiro.

Beginning in 1993, when the use of serological tests to control hepatitis transmittable by blood transfusion was first indicated, the IDU population began to represent a larger percentage of new cases. Co-infection of HIV/HCV is recorded in a proportion of IDUs that varies between 50% and 90%.<sup>5</sup>

The objective of the present study was to describe the profile of injecting drug users living with HIV/AIDS and estimate the prevalence of Hepatitis B and C in this group.

## METHODS

A cross-sectional study was conducted with injecting drug users living with HIV/AIDS in treatment at facili-

ties of the Municipal STD/AIDS Health Department of São Paulo (SMS-SP), from January to November of 2003.

The selection criteria for the centers were based on data provided in the Epidemiological Bulletins of the STD/Aids Department of the SMS-SP. In these Bulletins, the Northern and Central-eastern regions are identified as those with the largest number of Aids cases attributed to injecting drug use. The study was conducted in these regions, selecting three treatment units: STD/AIDS Referral Center (CR) "Nossa Senhora do Ó," STD/AIDS Specialized Treatment Service (SAE) Marcos Lottemberg in Santana, and the Specialized Outpatient Center in Vila Prudente.

A non-probabilistic sample of 205 people was selected consecutively. The interview candidates were selected according to analysis of their clinical records on the days of their clinical visits and invited, individually, to participate in the study, a decision made in a private room. Participation criteria included: having used injecting drugs at least once in their life; being HIV positive; and being older than 18. Four people who were invited refused to participate, alleging: one for being there only to receive treatment, another for not wanting to, the third for not being willing, and a fourth due to lacking the time to respond.

Structured interviews were realized by a team of 9 interviewers trained and advised by the study authors. A standardized questionnaire was applied, with closed questions, taken from the multiple site WHO II,\*\*\*\* study which included socio-demographic questions. The interviews also included questions regarding: drug use – age of first use of tobacco, alcohol and preferred illicit drugs; injecting drug use – motives, with who and where they get the drugs, use environment, injecting equipment and sharing of this equipment; seeking of health treatment related to drug use, and the location where the treatment occurred.

In addition to this, the questionnaire included questions regarding prevention activities, such as group/individual counseling, group talks, being approached in the street by a health agent or harm reduction peer educator, individual information, media channels (TV, radio, magazines, newspaper), being tested for HIV, provision of saline solution, condoms, needle and syringe exchange programs, organizations of drug users, campaign signs/brochures.

\* Monteiro MRCC. Estudo soroprevalência dos vírus da hepatite B e hepatite C em portadores da imunodeficiência humana/SIDA na Cidade de Belém do Pará – Brasil [doctorate thesis]. São Paulo: Faculdade de Medicina de Ribeirão Preto da USP; 2002.

\*\* Ministério da Saúde. Hepatites. Situação atual da doença. Brasília (DF): 2007 [Accessed on: 8/5/2007]. Available at: [http://portal.saude.gov.br/portal/saude/visualizar\\_texto.cfm?idtxt=22248](http://portal.saude.gov.br/portal/saude/visualizar_texto.cfm?idtxt=22248)

\*\*\* Bueno RC, Bastos FI, Andrade TM, Moreno I, Albuquerque JI. Estudo Comparativo de Soroprevalência para HIV e fatores de risco entre UDI nas cidades de Santos, Rio de Janeiro, Salvador, Campo Grande e Itajaí: Projeto Brasil do Instituto de Estudos e Pesquisas em AIDS de Santos/Coordenação Nacional de -DST/AIDS-Brasília: Ministério da Saúde; 1993.

\*\*\*\* World Health Organization. Multy-City Study on Drug Injecting and Risk of HIV infection. Programme on Substance Abuse – Final Report. Geneva;1994. (WHO/PSA/94.4).

Data was also collected in the interviews regarding the frequency of sexual relations, types of partners, and use of contraceptive methods, including condom use; knowledge regarding hepatitis, vaccination against hepatitis B or willingness to being vaccinated (in the cases in which they had not received the vaccine), and the use of existent services in the treatment centers.

For the serological component of the research, the anti-HCV test for hepatitis C was conducted using ELISA (Enzyme Linked Immuno Sorbent Assay), with the AxSYM System kit (Abbot). The tests for hepatitis B, HBsAg and anti-HBc total markers, were conducted using ELISA, with the AxSYM System kit (Abbot). The result of these exams was considered for up to one year. Those interviewed were encouraged to be vaccinated against hepatitis B, which was provided through a local service. They were also offered a harm reduction kit, which contained two syringes, two small cups, two alcohol wipes, two flasks of distilled water, and a male and female condom.

The information obtained was stored in a database constructed in EpiData. The data analysis was conducted in EpiInfo 6.0 and in Stata 8.0.

The research project was approved by the Research Ethics Committee of the São Paulo Municipal Health Department. Those interviewed signed an informed consent form.

## RESULTS

A total of 205 interviews were conducted including 137 in the STD/Aids Reference Center “Nossa Senhora do O”, 60 in the Specialized Service Center Marcos Lottemberg and eight in the Vila Prudente Specialized Outpatient Center.

Table 1 presents the sociodemographic profile of those interviewed, of which 81% were men and 19% women, with ages between 25 and 62 years old (average=39, sd=6.1). The marital status between the sexes was similar, being that 48% were single, 42% married, and 8% divorced. The large majority was born in São Paulo (75.6%) and 20% of those interviewed had a regular salary.

More than half (57%) of those interviewed were characterized as IDUs, meaning that they referred to injecting drug use at least one time in the six months prior to the interview. The rest were considered as ex-IDUs. The average age of first drug use was 18 years old, varying depending on the substance. The most common motives mentioned for starting to injecting drugs were curiosity and peer influence (Table 2).

In terms of the consequences of injecting drug use, 81% had never heard of hepatitis C and 85% did not know anyone with the disease.

**Table 1.** Distribution of sociodemographic characteristics of HIV positive injecting drug users. São Paulo, 2003.

Characteristic	N=205	%
Sex		
Male	166	81.0
Female	39	19.0
Schooling*		
1 to 4 years	164	80.4
5 to 8 years	35	17.1
9 to 11 years	4	2.0
More than 11 years	1	0.5
Marriage status**		
Single	99	48.6
Married	87	42.6
Separated	16	7.8
Widowed	2	1.0
Birth state		
São Paulo***	155	75.6
Others	50	24.4
Source of income		
Unstable	51	34
Benefits	32	22
Employeeed	29	20
Help from others	17	11
Autonomous	17	11
Others	2	2
Occupation in the last 6 months		
With occupation	107	52.2
Without occupation	98	47.8

\* 97% know how to read, 6 did not respond

\*\* one did not respond

\*\*\* 87% (135) in São Paulo

**Table 2.** Distribution of HIV positive injecting drug users according to average age and reason for beginning illicit drug use or not. São Paulo, 2003.

Variable	N	%	Average age	sd**
Drug used*				
First illicit drug	199	97.1	18.1	5.8
Tobacco	190	92.7	13.5	3.2
Alcohol	193	94.1	15.8	4.8
Marijuana	57	27.8	15.1	3.3
Cocaine	125	61.0	19.8	6.2
Injecting	201	98.0	20.0	6.4
Motives for injecting drugs				
Friends/peers	73	35.6		
Curiosity	104	50.7		
Others	28	13.6		

\*in general more than one illicit drug was referred to for first use

\*\*sd = standard deviation

**Table 3.** Distribution of hepatitis B and C seroprevalence rates by sex, HIV positive injecting drug users. São Paulo, 2003.

Positive serology for the markers	Male		Female		Total	
	N	%	N	%	N	%
Hepatitis B	100	88.5	13	11.5	113	55.1
HBsAg	52	92.9	4	7.1	56	27.3
Anti-HBc	96	88.1	13	11.9	109	53.2
Hepatitis C						
Anti-HCV	146	86.4	23	13.6	169	82.4

The needles and syringes were bought the majority of the time (89%). The trash was the location for throwing away used syringes and needles, mentioned by 63%. Fifty three percent related not sharing syringes and needles; among those who did, the most commonly cited motive was "I thought I was safe because I cleaned it first", cited by 66%. The sharing of recipients/flasks/spoons or cotton/filter was stated by 47%, one person refused to respond to this question. In addition, 52% said that they had shared a flask of drugs with other people.

Regarding the cleaning of used needles/syringes, 53 people interviewed stated that they occasionally clean them, and water was mentioned as the most common cleaning substance (67%).

In terms of seeking treatment for drug dependency, 35% reported looking for some form of treatment and 48% of them received some sort of care in this area.

The most common ways of accessing prevention information cited by those interviewed were, in a descending scale of frequency: television, radio and newspaper. Nonetheless, 54% reported not having access to information regarding prevention in the six months prior to the interview.

Three of every four people interviewed stated that they had never helped anyone to inject. Those who had helped another person said that this person was "acquainted."

The pharmacy was the most commonly reported location to get needles and/or new syringes, stated by 86%. In terms of the question of injecting with someone known to be HIV positive or diagnosed with hepatitis, 30% responded yes in relation to HIV and 13% in relation to hepatitis.

In terms of sexual behavior, 55% of the participants referred to sexual relations with a steady partner of the opposite sex. Nonetheless, 82% of those interviewed referred to having sexual relationships with occasional partners of the opposite sex. Homosexual relations were

mentioned by 9% of the 169 participants who were willing to answer this question.

The extreme gauges of condom use (never and always) corresponded, respectively to 46% and 39% of the responses. According the majority of people interviewed who reported being in a stable relationship (74%), their steady partner did not use injecting drugs; 81% of those interviewed stated that their partners did not have HIV and 90% that their steady partners did not have hepatitis C.

The contraceptive methods most commonly cited were male condoms (72%) and contraceptive pills (47%). Eight women (20%) of the 39 interviewed, reported using the female condom, 3.4% reported having sex for money, and the same percentage reporting trading sex for drugs. Only one person stated having paid more than two sexual partners to have sexual relations.

In terms of the hepatitis diagnosis (Table 3), 84% of those interviewed had hepatitis C. In terms of hepatitis B, the presence of antibodies was found in 55.1% (95% CI: 49;63) of the participants, indicating a current or past infection. Considering HBsAg as a marker of current infection, the prevalence rate was 27.3% (95% CI: 22;36), of which 92.9% were males and 7.1% females.

Of those interviewed, 81% did not know anything about the existent types of hepatitis.

In terms of the vaccine against hepatitis B, 42% had not ever had it and the majority (94%) was willing to be vaccinated. However, at the time, there was not a sufficient stock to vaccinate everyone.

## DISCUSSION

The high prevalence of hepatitis B and C among injecting drug users found in the current paper confirms studies conducted with the same target population.<sup>2,\*</sup> On the other hand, there is a difference in the prevalence rates found among people living with HIV in general.<sup>6,8</sup>

\* Mesquita FC. Aids entre usuários de drogas injetáveis na última década do século XX, na região metropolitana de Santos -Estado de São Paulo - Brasil [doctorate thesis]. São Paulo: Faculdade de Saúde Pública da USP; 2001.

The distribution according to sex and educational level coincides with a description in a previous study,<sup>\*</sup> in which it was found that the majority of IDUs are men. The average number of years of schooling in the current research was six years, similar to findings in another study.<sup>2</sup>

The start of drug use at 18 years old, on average, and cocaine as the most commonly reported drug, confirm national data.<sup>2,\*\*</sup>

The sharing of injecting material showed a high level of reuse of equipment and high exposure to infection risk to diseases transmitted intravenously. In spite of the fact that half of those interviewed reported not sharing injecting equipment, 62% referred to occasionally reusing syringes/needles. Cleaning of needles/syringes appeared to occur only occasionally, and when mentioned, was done with water, which is ineffective against infection. The most common motive cited for sharing was “feeling safe, because I cleaned it first”. Previous studies cited “fear of overdose” and “not having my own syringe for drug use”<sup>2</sup> as the most relevant motives to share syringes. The change in the justification for sharing syringes, e.g. “feeling safe, because I cleaned it first”, can be credited to prevention activities. Since before the needle distribution policy, health services have informed people at the time of being tested regarding the importance of using clean syringes and how to disinfect them. However, the message has not been well transmitted.

The high rate of needle and syringe sharing indicates that harm reduction programs for the São Paulo population are still their beginning phases, a possible result of their recent implementation at the time of the study implementation.<sup>1</sup> Few prevention activities were mentioned, and within these, those with the largest impact were those on television, radio, or newspapers. This reveals the need to intensify this work and for more specific actions to reach this population, as it is possible to reduce the incidence of viral infections.

It is important to question how people living with HIV and being treated in public health services do not have access to information regarding hepatitis B and C prevention. As an effect of this, the participants did not identify any prevention actions from the services,

only those from the media. A study conducted in New York City in the period between 1990 and 2001 showed a reduction of the prevalence rates of HIV and HCV of 54% to 13% and from 80% to 59%, respectively, due to the expansion of a needle exchange program.<sup>3</sup>

In terms of treatment of drug users, it can be observed that the percentage of those seeking care is a little higher than that mentioned in previous studies,<sup>\*\*\*</sup> without however, there being a corresponding response of available health services for this demand.

The fact that this group has a sexually active lifestyle, many with steady partners and injecting cocaine users, accentuates the importance of prevention actions and a larger dissemination of information regarding the prevention of diseases transmitted sexually and intravenously, such as HIV and HCV. The offer of the vaccine against hepatitis B, especially for women, has become crucial for preserving the health of this population.

All of those interviewed were patients of specialized STD/AIDS services in São Paulo, and the vaccine against hepatitis B has been available since 2001. These factors show the low level of information and knowledge regarding hepatitis in the interviews. The small number of individuals vaccinated against hepatitis B shows that there is still a lot to do in order to guarantee access to the São Paulo population to all of the services offered by the National Health System (SUS).

The problems identified in the current study may be a result of the fact that the services were not completely suitable to attend to the injecting drug user population and the difficulties encountered in accessing this group. The high prevalence of hepatitis B and C found confirm the elevated risk of these infections among injecting drug users. The lower level of knowledge regarding hepatitis indicates an urgent need to intensify HIV harm reduction actions, such as the inclusion of clearer explanations regarding hepatitis infections and the vaccination against hepatitis B in such strategies. Among the population interviewed in the current study, low access to chemical dependence treatment was found, even when there was a desire among the users for such services. This raises the possibility of this service being more utilized, when linked to care of the researched infections.

\* Caiiffa WT. Projeto A<sub>1</sub>UDE-Brasil. Avaliação epidemiológica dos usuários de drogas injetáveis dos projetos de redução de danos apoiados pela Coordenação Nacional de DST/AIDS. Brasília: Ministério da Saúde; 2001.

\*\* Mesquita FC. Aids entre usuários de drogas injetáveis na última década do século XX, na região metropolitana de Santos -Estado de São Paulo - Brasil [doctorate thesis]. São Paulo: Faculdade de Saúde Pública da USP; 2001.

\*\*\* Bueno RC, Bastos FI, Andrade TM, Moreno I, Albuquerque JI. Estudo Comparativo de Soroprevalência para HIV e fatores de risco entre UDI nas cidades de Santos, Rio de Janeiro, Salvador, Campo Grande e Itajaí - Projeto Brasil. Instituto de Estudos e Pesquisas em AIDS de Santos/CN -DST/AIDS-Brasília: Ministério da Saúde; 1993.

## REFERENCES

1. Bueno R, Trigueiros D. O Projeto de Redução de Danos da Cidade de São Paulo. In: Mesquita F, Souza CR, organizadores. DST/AIDS a Nova Cara da Luta Contra a Aids na Cidade de São Paulo. São Paulo: Raiz da Terra; 2003.
2. Carvalho HB, Mesquita F, Massad E, Breno RC, Lopes GT, Ruiz MA, Burattini MN. HIV and infections of similar transmission patterns in a drug injectors community of Santos, Brazil - *J Acquir Immune Defic Syndr Hum Retrovirol*. 1996;12(1):84-92.
3. Des Jarlais DCA, Perlis TA, Arasteh KB, Torian LVC, Hagan HB, Beatrice SC, et al. Reductions in hepatitis C virus and HIV infections among injecting drug users in New York City, 1990-2001. *AIDS*. 2005;19(Supl 3):20-5.
4. Focaccia R, Conceição OJ, Sette H, Sabino E, Bassit L, Nitrini DR, et al. Estimated prevalence of viral hepatitis in the general population of the municipality of São Paulo, measured by a serologic survey of a stratified, randomized and residence-based population. *Braz J Infect Dis*. 1998;2(6):269-84.
5. Joseph J, Stoff DM, van der Horst C. HIV/hepatitis C virus co-infection: basic, behavioral and clinical research in mental health and drug abuse. *AIDS*. 2005;19(Supl 3):3-7.
6. Marins JRP, Barros MB, Machado H, Chen S, Jamal LF, Hearst N. Characteristics and survival of aids patients with hepatitis C: the Brazilian National Cohort of 1995-1996. *AIDS*. 2005;19(Supl 4):27-30.
7. Mendes-Corrêa MCJ, Barone AA, Cavalheiro NP, Tengan FM, Guastini C. Prevalência das hepatites B e C em pacientes infectados pelo vírus da imunodeficiência humana, em São Paulo, Brasil. *Rev Inst Med Trop S Paulo*. 2000;42(2):81-5.
8. Mendes-Corrêa MC, Barone AA, Guastini C. Prevalência e fatores de risco da hepatite C em pacientes infectados pelo vírus da imunodeficiência humana. *Rev Inst Med Trop S Paulo*. 2001;43(1):5-19.
9. Segurado AC, Braga P, Etzel A, Cardoso MR. Hepatitis C virus coinfection in a cohort of HIV-infected individuals from Santos, Brazil: seroprevalence and associated factors. *AIDS Patient Care STDS*. 2004;18(3):135-43.