Hepatitis C and HIV in injecting drug users in Armenia, Colombia

Hepatitis C y VIH en usuarios de drogas inyectables en Armenia-Colombia

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Abstract

A constant and progressive increase in the availability of heroin in Colombia in recent decades and the intravenous use of this drug have established the need to prevent a possible epidemic of HIV and hepatitis C. This research determined the sero-prevalence of hepatitis C and HIV according to sociodemographic characteristics and risk behaviors in people who inject drugs in Armenia, Colombia. This is a cross-sectional study on 265 users captured through respondent-driven sampling after informed consent. Sero-prevalence of hepatitis C was 22.3 % [95% CI 12.3 % -23.5 %]; for HIV infection, it was 2.6 % [95% CI 0.4 to 6.0]; 67.5% reported injecting for more than two years, 35 % shared needles and syringes, and 12.4 % had used a condom during their last sexual intercourse. Users who did not purchase syringes in drugstores in the last six months are 2.7 times [95% CI 1.32 to 5.48] more likely to contract hepatitis C; daily injection frequency was higher in HIV- positive cases [OR 2.87; 95% CI 0.55 to 15.9] but nonsignificant. One fourth of respondents are infected with HIV or hepatitis C, either as a single infection or co-infection. This study identified risk practices such as sharing needles and low condom use in the last six months, worldwide documented and discussed risk factors. This research is a first step in the search for strategies to prevent the spread of HIV infection and hepatitis C in networks of injecting drug users.

Key words: hepatitis C, HIV, heroin, epidemiology.

Resumen

Un aumento constante y progresivo en la disponibilidad de heroína en Colombia en las últimas décadas, y el uso de esta droga vía intravenosa, ha establecido la necesidad de prevenir una posible epidemia de VIH y hepatitis C. Esta investigación determino la seroprevalencia de hepatitis C y VIH según características sociodemográficas y comportamientos de riesgo en población que se inyecta drogas en Armenia-Colombia. Estudio transversal en 265 usuarios captados a través de muestreo guiado por el encuestado previo consentimiento informado. La seroprevalencia de hepatitis C fue 22,3% [IC95% 12,3%-23,5%]; la infección por VIH fue 2,6% [IC95% 0,4-6,0]. El 67,5% reportó inyección por más de dos años, el 35% compartió jeringas y agujas y el 12,4% utilizó condón en su última relación sexual. Los usuarios que no adquirían jeringas en droguerías en los últimos seis meses tienen 2,7 [IC95% 1,32-5,48] veces el riesgo de hepatitis C; la frecuencia diaria de inyección fue mayor en los casos positivos con VIH [OR 2,87; IC95% 0,55-15,9] pero no significativa. La cuarta parte de los encuestados, están infectados por VIH o hepatitis C, en forma de infección única o coinfección. Este estudio identificó prácticas de riesgo, como compartir jeringas y baja utilización del condón en los últimos seis meses, factores de riesgo documentados y discutidos mundialmente. Esta investigación constituye un primer paso en la búsqueda de estrategias para prevenir la propagación de infecciones por VIH y hepatitis C en redes de usuarios de drogas inyectables.

Palabras clave: hepatitis C, VIH, heroína, epidemiologia.

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The World Health Organization (WHO, 2012) calculates that each year, between three and four million people worldwide are infected with hepatitis C virus (HCV), 150 million people suffer from chronic infection, and 350,000 people die from HCV-related diseases.

Hepatitis C is distributed worldwide. It is estimated that each injecting drug user (IDU) who acquires HCV can transmit the virus approximately to 20 people, and half of these transmissions occur in the first two years of infection (Magiorkinis et al., 2013).

According to UNAIDS (2012), transmission of HIV by injecting drug use continues to be one of the most important challenges. It is estimated that in 49 countries, the prevalence of HIV in IDUs is 22 times higher than in the rest of the population; and in 11 countries, the level of infection is 50 times higher. To this challenge are added stigma and lack of access to health services.

Worldwide HIV seropositivity in population aged 15-49 years is 0.8% but morbidity from this infection still varies considerably between countries and regions (UNAIDS, 2012).

HIV and HCV epidemics associated with injected drug use have been widely documented and the search for appropriate and timely intervention is currently one of the priority actions in countries where this type of consumption is observed (WHO, 2012).

Latin American countries are characterized by a mainly concentrated HIV epidemic, affecting people who use drugs, sex workers, transgender people, and people who have sex with men. Among these people who use drugs, the group that has been identified as the most vulnerable is that of IDUs (Bravo & Barrio, 2008).

In 2010, a study of HIV prevalence and risk behaviors in IDUs was carried out in two cities of Colombia (Medellín and Pereira), the results of which reported prevalences of 3.8% and 1.9%, respectively. This study concluded that there is a risk of extending HIV to other cities of Colombia among the networks of IDUs (Berbesi et al., 2012). As can be expected, in Colombia, infection by HIV also has been defined as a concentrated epidemic that fulfills the conditions established by the WHO (UNAIDS, 2000).

During the last decades, a steady and progressive increase in the availability of heroin in Colombia has revealed the need to prevent a possible epidemic of infections such as HIV and HCV due to the intravenous consumption of drugs (Berbesi et al., 2013). Although drug use is decriminalized in the country since 1994, the health system has not been adequately developed, and there are no clear policies against mitigation, reduction, or needle exchange programs (Gómez, 2013).

Therefore, this study sought to estimate the prevalence of HIV and HCV and to identify risk behaviors for their transmission among IDUs in Armenia-Colombia.

Method

A cross-sectional study was conducted using respondent-driven sampling. The target population was IDUs living in the city of Armenia[1]-Colombia. Inclusion criteria were being an active IDU (in the past six months); being between 18 and 65 years of age, signing the informed consent, and having an effective of Respondent Driven Sampling (RDS) coupon.

Recruitment began with a group of "seeds" or participants selected nonrandomly from the target population through key informants. These people received two types of economic incentives: primary, for participating in the study and secondary, linked to the successful recruitment of three new participants. The incentive values ranged between US $5 and $4, respectively.

To calculate sample size, the Fleiss formula was used to estimate a proportion, the confidence level was 95%, absolute accuracy was 4%, design effect was 4, with an expected ratio of 3%, taking into account the HIV prevalence among the IDU population in 2010 (Berbesi et al., 2012). The size of the sample was of 250 IDUs; RDS sampling estimates sampling errors through measures such as homophilia, heterophilia, and proportional population estimates. The sample size was reached within a period of six weeks.

We used the same instrument as was applied to the IDU population in Medellin and Pereira in 2010 (Berbesi et al., 2012), which was based on that designed by the WHO in Bogota in 2000 by Mejía and Gómez (2005). This form included questions about the demographic characteristics and risk behaviors and was applied by a group of previously trained and standardized interviewers; blood samples were also taken in filter paper for laboratory tests to detect HCV and HIV; cases were confirmed by RNA Viral load tests and Western Blot, respectively.

The statistical analysis of the data and tables of results were generated with RDSAT® and SPSS® 21.0. We described the socio-demographic characteristics of the IDUs and the determination of HCV and HIV prevalence with 95% confidence intervals (CI 95%). The association between injection frequency, sharing syringes and needles, purchasing syringes at the drugstore, and the use of a condom in the last six months and prevalence of HCV and HIV was established through Chi-square, and the strength of association was calculated by means of the odds ratio (OR) and CI 95%.

The raw measures of association for HCV were adjusted through binary logistic regression, in which we included associated factors or *p*-values less than .25 (Hosmer-Lemeshow criterion). This analysis was not performed for HIV due to the low number of cases.

1 Armenia is considered a medium-sized city, which carries out functions of intermediation between smaller nuclei and the large metropolitan areas of the country; its population projected for 2014 is approximately 400,000 according to figures from the National Administrative Department of Statistics (DANE).

This project was endorsed by the institutional Committee of Ethics of the CES University. Confidentiality was ensured, and informed consent was obtained.

Results

With regard to the 265 participating IDUs' socio-demographic characteristics, it was found that 87% (214) were male, 76% were single, and 48% (136) were in the age range of 25 to 34. The mean age was 26.8 years (*SD* = 5.68); age range was 18 to 50 years. By sex, the men's mean age was 27 years, and the women's was 25.7 years. In terms of socio-economic status, 83.3% were low level, 14.4% medium level, and 2.3% had a high level. Of the IDUs, 75.8% had complete secondary studies, 27.9% were autonomous workers, 25.3% had temporary jobs, and 20.8% were street vendors.

There was a 2.6% prevalence of HIV (95% CI [. 40, 6.0]), 1.1% presented indeterminate results, perhaps due to the stage of seroconversion. For men, the prevalence of HIV was 2.7%, and for women, it was 2.9%. No statistically significant association between sex and prevalence of HIV was identified.

Likewise, 31.0% of the IDUs presented reactivity for HCV antibodies, and 22.3% (95% CI [12.3%, 23.5%]) presented active infection of HCV. By sex, the prevalence of hepatitis in men was 22.4%, and in women, it was 22.9%, finding no statistically significant differences.

Regarding the consumption practices investigated, 67.5% of users reported having injected for more than two years, and 35% had shared syringes and needles. In relation to sexual practices, 87.6% of IDUs admitted not using condoms

Table 1
Proportional Estimate of the Sociodemographic Characteristics of Injecting Drug Users. Armenia-Colombia

Age group	Proportional estimate of the population (%)	95% CI
Age		
18 to 24 years	42.0	34.0-49.4
25 to 34 years	48.0	40.7-56.1
35 to 44 years	7.1	3.8-10.7
45 years or older	2.9	0.7-5.8
Sex		
Male	87.3	82.9-92.8
Female	12.7	7.2-17.1
Level of schooling		
Primary	11.4	6.7-16.3
Secondary	75.8	68.7-82.1
Higher	12.4	7.7-18.5
Civil status		
Single	76.2	70.6-81.8
Married/common-law marriage	17.2	12.0-22.8
Divorced/separated	5.6	2.8-8.7
Widowed	1.0	0.0-2.8

Note. *CI = Confidence interval.

Table 2
Demographic Characteristics and Risk Behaviors in Injecting Drug Users related to Hepatitis C and HIV. Armenia 2014

	Hepatitis C					VIH				
Variable	n	%	ORc	IC	Valor de p	n	%	ORc	IC	Valor de p
Sex										
Females	8	22.9	1.03	0.44-2.40	0.95	1	2.9	1.06	0.12-9.11	0.96
Males	50	22.4	1.00			6	2.7	1.00		
Schooling										
Primary	7	23.3	1.07	0.44-2.64	0.88	2	6.7	3.29	0.61-17.7	0.17
Secondary	52	22.1	1.00			5	2.1	1.00		
Injection frequency (last 6 months)										
Daily	30	24.0	1.2	0.68-2.16	0.52	5	4.0	2.87	0.55-15.9	0.21
Weekly	29	20.7	1.00			2	1.4	1.00		
Shared syringes (last six months)										
Yes	22	24.2	1.18	0.64-2.16	0.6	7	3.3	1.4	0.30-6.42	0.66
No	36	21.3	1.00			4	2.4	1.00		

Note. *OR: Razón de disparidad

when having sex with stable partners in the last six months; 54.3% did not use condoms with casual partners, and 22.5% did not use condoms with prostitutes.

Regarding the socio-demographic characteristics of the positive cases of HCV infection, 85.7% were men, and 71.4% had started secondary school, their mean age was 27.69 years, and 75% of the IDUs with hepatitis C were 32 years old or younger. Regarding consumption practices, as with HIV, having injected drugs for more than two years and sharing injection equipment were more frequently reported in the positive cases, like previously documented risk behaviors but which were not statistically significant in this study.

An important finding is that people who had not bought their syringes in drugstores in the last six months were 2.7 times more likely ([95% CI [1.32, 5.48]) to acquire hepatitis C than users who reported that they had bought their syringes in drugstores.

Regarding other injection risk practices, such as sharing cotton, spoons, and water, we found no statistically significant differences in performing these practices and having hepatitis C.

Table 3
Risk Factors Associated with Hepatitis C in People who inject Drugs. Raw and Adjusted OR

Variable	%	ORr	95% CI	P-value	ORa	95% CI	P-value
Time-interval injections							
> 4 Years	26.8	1,71	1,13-2,57	0,01	1,68	0,94-3,00	0,08
< 4 Years	18.1						
Condom use							
No	27	7,01	0,91-54,18	0,06	6,63	0,83-52,80	0,07
Yes	5						
HIV-positive							
Yes	42.9	2,71	0,59-12,44	0,20	10,22	0,84-124,22	0,07
No	21.7						
Buys syringes in drug stores (last six months)							
No	39	2,69	1,32-5,48	0,01	2,96	1,09-8,01	0,03
Yes	19.2						
Sex							
Females	22.9	1,03	0,44-2,40	0,95	1,43	0,52-3,97	0,48
Males	22.4						
Age M(SD)							
HCV	26.6 (5.5)	1,03	0,98-1,08	0,19	0,98	0,91-1,05	0,65
No HCV	27.6 (6.0)						

Note. *ORr = raw odds ratio. ORa = adjusted odds ratio. CI = Confidence interval.

Table 4. *Injecting Characteristics in Injection Drug Users and HCV. Armenia 2014*

In the last six months...	Yes	95% CI
Has injected with syringes containing the mixture ready for use	12.7%	8.5-16.9
Has shared the mixture with others	21.3%	16.0-26.6
Has shared cotton, spoons, or water with others	21.7%	16.5-26.9
Has taken doses of a mixture of drugs that others were also sharing	19.3%	14.3-24.3
Has injected in an outdoor consumption place	79.9%	74.9-85.0
Has been injected by a person who is paid for injecting	21.6%	16.4-26.8
Has injected with a "homemade" syringe"	7.4%	4.0-10.7

Discussion

According to UNAIDS (2012), there is sufficient evidence showing that harm reduction programs can significantly reduce the transmission of infections such as HIV and HCV among IDUs. However, this is not yet apparent in Colombia. Official drug policies continue to pay more attention to the reduction of supply and drug trafficking (USAID, 2012), and this is one of the few studies on the practices of IDUs in an intermediate city of the country (Berbesi et al., 2013), and the only work that includes the detection of hepatitis C in IDUs with the RDS methodology (Ramírez et al., 2005). This study identified a significant number of IDUs who perform risk practices, such as sharing syringes and a low use of condoms, risk factors which have been documented and widely discussed in other countries for several decades (Ball, et al., 1998; Des Jarlais & Friedman, 1987; Des Jarlais et al., 2013).

In relation to the sociodemographic characteristics, the IDUs in this study, as in the rest of the world, are predominantly male, with a mean age of 26 years, younger than those reported in other investigations (Clatts et al., 2010; Platt et al., 2009). Of the IDUs, 50% had begun injecting four years ago; the available evidence suggests that HCV is acquired relatively quickly after starting to inject (Garten et al., 2004). This is a fundamental aspect in the prevention and control of infection in users who have initiated this risk practice.

In Mexico, the individual, social, and environmental factors were independently associated with HIV infection among IDUs in Tijuana. These findings suggest the need to intervene not only in individual risk behaviors, but in the social processes that drive these behaviors (Strathdee et al., 2008).

One fourth of the IDUs in this study are infected by HIV or HCV, in the form of single infection or co-infection, very low numbers compared to those found in other countries (Platt et al., 2008; Ruan et al., 2007). However, this group has a high prevalence in comparison with the general population of the country (Ministry of Health and Social Protection, 2012), linked not only to the injection of drugs, but also other to characteristics and risk behaviors (Hagan et al., 2007).

Transmission through shared needles and syringes, having injected drugs for more than four years, and having sex without using condoms are classical risk factors for the acquisition of HCV and HIV (Shapatava et al., 2006). This research identified that the risk of hepatitis C was six times higher in people who had not used condoms in the past six months.

In this study, being female was not a significant risk factor for infections, unlike the findings in other investigations (Oliveira & Paiva, 2007). Women have been identified as likely to work in prostitution, have sex under the influence of substances, and they are in a situation of submission that does not allow them to negotiate safe sex, thereby increasing transmission of HIV and becoming an even more complex public health problem (Mendez et al., 2009).

However, in this work, the fact of not purchasing syringes in drug stores was identified as a risk factor for hepatitis C, which possibly suggests that users acquire syringes in other places (drug shops, crack houses[2], among others), which may be contaminated, as there are no needle exchange programs in Colombia. In this research, we also found a directly proportional tendency between infection positivity and increased injection frequency, similar to the observations of a research conducted in Uruguay (Osimani et al., 2005).

Successful efforts to prevent the transmission of infections among IDUS have been related to the implementation of harm reduction programs; however, no intervention has led to the elimination of risk behaviors. To reduce HIV transmission, harm reduction strategies may be sufficient, whereas HCV control may require the use of injection practices that ensure the elimination of exposure to contaminated equipment.

Important differences in the epidemiology of HIV and HCV in different populations of IDUs have been recognized. The prevalence of HIV varies from 5 to 80%, with HCV prevalence showing a lower range (50-90 %). The factors that favor the rapid spread of HCV among IDUs suggest that HCV infection in a population of IDUs may become endemic in a relatively short time, as HIV transmission is slower (Hagan & Jarlais, 2000; Platt et al., 2009).

Prompt actions are required to prevent an epidemic in Colombia. It is very important for the country to prioritize policies of harm reduction and prevention strategies of hepatitis C and HIV for IDUs, with the implementation of needle exchange programs, as well as the safe disposal of contaminated syringes and needles, among other public health measures.

As the limitations of this study, we note that respondent-driven sampling is considered nonrandom sampling that must comply with a series of assumptions to be considered as an independent and representative sample of the social network. Due to the type of design (cross-sectional study), it is not possible to conclude cause-effect relations between HCV infection and the risk factors found. The population with the highest socioeconomic level was not included in this study, possibly due to the lack of interest in receiving an incentive for participating. Finally, as the data was obtained from reports of risk practices, inaccurate responses may have affected the results.

In conclusion, an IDU profile was identified: male, under 34 years of age, with secondary education, single, with high injection frequency, and low condom use in the past six months; one fourth of them are infected with HIV or HCV in the form of single infection or co-infection; moreover, one out of three also shared syringes. For Colombia, this research is a first step in the search for prevention strategies.

2 Meeting place used for micro-traffic and drug consumption

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Conflicts of interest

There are no conflicts of interest.

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