HEPATITIS C VIRUS ANTIBODY STATUS, SOCIODEMOGRAPHIC CHARACTERISTICS, AND RISK BEHAVIOUR AMONG INJECTING DRUG USERS IN CROATIA

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SUMMARY

The study was conducted among 76 injecting drug users (IDU) from seven Croatian cities during a three-year period (2005–2007). Each participant completed a questionnaire on sociodemographic characteristics and potential risk factors for hepatitis C virurs (HCV) infection followed by anti-HCV and anti-HIV antibody testing. The mean patient age was 30. The majority of patients (69.8%) reported more than one potential exposure to HCV: 97.1% had shared injecting equipment, 75% reported risk sexual behaviour, and 56.3% reported a history of travelling abroad. The overall HCV seroprevalence was 51.3% (95% CI=40–63%). HCV seroprevalence increased with increasing number of risk behaviours (p=0.026). Needle sharing frequency was the most important risk factor for hepatitis C. The HCV seroprevalence rate ranged from 27.3% in IDUs who answered that they shared needles occasionally to 100% in IDUs who always shared needles (p<0.001). No other risk factors (age, gender, educational level, marital and employment status, history of travelling abroad and sexual risk behaviour) were associated with HCV seropositivity.

Key words: hepatitis C, IDU, seroprevalence, risk factors

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INTRODUCTION

Hepatitis C virus (HCV) infection represents a global health problem. The World Health Organization estimates that 170–200 million people worldwide are chronically infected with HCV (1). Seroprevalence of HCV varies in different risk groups such as recipients of previously unscreened blood or blood products (before 1992), hemophiliacs, patients in hemodialysis centers and injecting drug users (IDUs). The prevalence of anti-HCV is highest in IDUs and hemophilia patients (up to 95%) (2–8) and highly variable in hemodialysis patients (10–90%) (9, 10). In addition, HCV coinfection with human immunodeficiency virus (HIV) is common among IDUs, who acquire both viruses from injecting (11, 12). IDUs may also be at sexual risk of HCV infections, as they exhibit risky sexual behaviour (multiple sexual partners, IDU partners and commercial sex activity) (14). Several studies have found evidence for the sexual transmission of HCV (14–16).

This study analyzed the seroprevalence, sociodemographic characteristics as well as injecting and sexual risk factors associated with HCV infection among IDUs in Croatia.

MATERIALS AND METHODS

Population

This cross section study was conducted among 76 injecting drug users from seven Croatian cities during a three-year period (2005–2007). The respondents were recruited among clients of voluntary counselling and testing services. After obtaining informed consent, each participant completed a questionnaire followed by venipuncture for anti-HCV and anti-HIV antibody testing. The data obtained included sociodemographic information (age, gender, educational level, marital and employment status), history of travelling abroad, and their injecting and sexual risk behaviours. Questions relating to drug use included whether and how often the respondents shared injecting equipment. Sexual risk variables included: number of sexual partners in the preceding year, being a man who has sex with men (MSM), being a sex worker (SW) or a client of SW, and having a history of sexually transmitted infections (STIs). All participants received educational material and counselling on HIV and hepatitis C (17).

Serologic Testing

Serum samples were tested for anti-HCV antibodies using a third generation enzyme-linked immunosorbent assay (Ortho HCV 3.0. ELISA Test, Ortho-Clinical Diagnostics, Raritan, NJ). Initially reactive samples were retested in duplicate and positive samples were determined by the manufacturer cut-off value (average of 3 negative samples±0.330). Anti-HIV antibodies were detected using fourth generation enzyme-linked fluorescent assay (Mini Vidas HIV Duo Quick; BioMerieux, Marcy l'Etoile, France).

Statistical Analysis

Mann-Whitney U and Fisher's exact test were used to compare differences between groups. For statistical analysis, SPSS version 17.01 (SPSS, Inc., Chichago, IL) software was used. P<0.05 was considered to be statistically significant.

Table 1. *Anti-HCV prevalence by sociodemographic characteristic and potential risk factors*

Characteristic	No. of participants (%)	Anti-HCV positive N (%)	p value
Sex			0.256
Male	69 (90.8)	37 (53.6)	
Female	7 (9.2)	2 (28.6)	
Age groups			0.133
20–29 years	43 (56.6)	20 (46.5)	
30–39 years	26 (34.2)	12 (46.2)	
40–49 years	7 (9.2)	7 (100.0)	
Educational level			0.051
<Primary school	8 (10.5)	7 (87.5%)	
High school	56 (73.7)	26 (46.4)	
>High school	5 (6.6)	2 (40.0)	
Missing	7 (9.2)	4 (57.1)	
Marital status			0.268
Married	10 (13.1)	8 (80.0)	
Single	41 (54.0)	21 (51.2)	
Steady sexual partner	12 (15.8)	5 (41.7)	
Separated/divorced	9 (11.8)	3 (33.3)	
Missing	4 (5.3)	2 (50.0)	
Employment status			0.435
Employed	19 (25.0)	8 (42.1)	
Unemployed	56 (73.7)	31 (55.3)	
Missing	1 (1.3)	–	
History of travelling abroad			0.838
Yes	28 (36.9)	15 (53.6)	
No	45 (59.2)	24 (53.3)	
Missing	3 (3.9)	–	
Sharing needles/syringes			–
Yes	66 (86.9)	38 (57.6)	
No	2 (2.6)	0 (0)	
Missing	8 (10.5)	1 (12.5)	
Needle share frequency			<0.001
Never	2 (2.9)	0 (0)	
Occasionally	22 (32.4)	6 (27.3)	
Frequently	39 (57.4)	27 (69.2)	
Always	5 (7.4)	5 (100.0)	
Risk sexual behaviour*			0.591
Yes	57 (75)	31 (54.4)	
No	19 (25)	8 (42.1)	
Number of sexual partners			0.108
0–9	66 (86.9)	37 (56.0)	
10–19	6 (7.9)	2 (33.3)	
≥20	2 (2.6)	0 (0)	
Missing	2 (2.6)	–	
History of STIs			0.286
Yes	23 (30.3)	19 (82.6)	
No	53 (69.7)	30 (56.6)	
Number of risk factors			
1	23 (30.2)	9 (39.1)	
2	34 (44.7)	15 (44.1)	
3	12 (15.8)	10 (83.8)	
4	5 (6.6)	3 (60.0)	
5	2 (100.0)	2 (2.6)	0.026

*Having multiple sexual partners, being a man who have sex with men, being a commercial sex workers (SW) or a client of SW

RESULTS

Sociodemographic Characteristics and Risk Behaviours

Sociodemographic characteristics and risk behaviours of study participants are shown in Table 1.

Patient age ranged from 21 to 48 years with the mean±SD of 30±6 years and a median age of 28 years. Out of the 76 participants, 69 (90.8%) were males. About one half of participants (54%) were single, 80.3% have graduated high school or had higher education and 73.7% were unemployed. All participants denied a history of blood transfusion while 36.9% reported a history of travelling abroad. A majority of patients (69.8%) reported more than one potential exposure to HCV. Eighty-six point nine percent of participants answered that they share injecting equipment, and 75% reported risk sexual behaviour: having multiple sexual partners (66.2%), being a MSM (11.8%), being a SW or a client of SW (15.8% and 22.4%, respectively) and having STIs (30.3%).

HCV Seroprevalence

The overall HCV seroprevalence was 51.3% (95% CI=40–63%). HCV prevalence was higher in men (53.6%; 95% CI=42–65%) than in women (28.6%; 95% CI=0–62%), although this difference was not significant (p=0.256). In participants 40 years or older, HCV seropositivity was 100% compared with 46% in younger participants. The HCV seroprevalence rate did

not vary significantly between age groups (p=0.133). Neither marital (p=0.268) nor employment status (p=0.435) was associated with HCV seroprevalence. Participants who reported risky sexual behaviuor showed a somewhat higher seroprevalence rate than those who did not (54.4% versus 42.1%), but this difference was not significant (p=0.591). There was no association of HCV seroprevalence with the number of sexual partners (p=0.108) or a history of STIs (p=0.286). Needle sharing frequency was the most important risk factor significantly associated with HCV seropositivity. The seroprevalence rate increased from 27.3% in IDUs who answered that they shared needles occasionally to 100% in IDUs who always shared needles (p<0.001). The number of risk factors was also associated with HCV seropositivity (p=0.026) (Table 1). None of the participant was anti-HIV positive.

DISCUSSION

After the introduction of HCV antibody screening of the blood supply, intravenous drug use has become the most important mode of HCV transmission. In Europe, seroprevalence of hepatitis C in IDUs varies from 10–40% in Hungary and the Czech Republic, to 40–70% in Italy, Germany, France, the Netherlands and Ukraine, reaching up to 80–90% in Denmark, Finland and Spain (12).

There are very limited data on the seroprevalence and risk factors for HCV infection among Croatian IDUs. IDUs constitute a marginalized and hard-to-rich population. The high proportion of anti-HCV antibodies in this study (51.3%) indicates that HCV infection is common in this risk group in Croatia. Patients with positive results were referred to treatment centres for infectious diseases (18).

There is no concordance between seroprevalence studies as to whether gender represents a risk factor for HCV transmission. While some studies reported a higher prevalence of hepatitis C in males (3, 4, 19), other reported no gender difference in HCV rates (13, 20). Our results showed a higher seroprevalence of hepatitis C in males (53.6%) compared to females (28.6%). This difference was not significant (p=0.256), but there were only seven women in this study. Men are probably more prone to experiment with drugs.

Lower educational level is believed to be an important factor for higher prevalence of hepatitis C (19, 21). In this study, anti-HCV positivity was 87.5% in IDUs who had not graduated high school compared with 45.9% of IDUs who had graduated high school or had higher education but this difference did not reach statistical significance (p=0.051). Age (p=0.133), marital status (p=0.268) and employment status (p=0.435) were not associated with HCV seropositivity.

Like the majority of similar studies worldwide (22, 23), we demonstrated association between frequency of sharing needles and syringes and HCV seroprevalence. HCV seropositivity was the highest among IDUs who had always shared needles (100%) compared to those who shared needles frequently (69.2%) and those who shared needles occasionally (27.3%; p<0.001). Croatia implemented harm reduction programmes, including needles and syringes exchange which is mostly performed by non-governmental organizations (18).

Some studies have shown that co-infection with HIV significantly increases the probability of HCV infection among IDUs (13). We documented no HIV-HCV co-infection in this study.

In this study, the majority of participants (69.8%) reported multiple risk behaviours. It is possible that risk factors other than injection drug use might have been responsible for HCV transmission in IDUs. The results of the recent study conducted in Croatia showed that high risk sexual behaviuor is associated with an increased risk of HCV infection (16). We evaluated sexual risk factors for their association with anti-HCV prevalence in this group. Risk sexual behaviour was reported by 75% participants. Although not significant (p=0.591), a higher HCV seroprevalence rate demonstrated in IDUs who reported risk sexual behaviour (54.4%) than in those who did not (42.1%) indicates that interaction of risk sexual behaviour with injecting risk behaviour cannot be disregarded.

Another possible risk factor for HCV acquisition may be a residence or travel in a region in which HCV infection is endemic (24). A study conducted among young IDUs in San Francisco showed significantly higher prevalence of HCV in IDUs who had travelled compared to those who had not (25). In this study, we found no difference in HCV seropositivity between participants with a history of travelling abroad and those who denied travelling (p=0.838).

The main limitation of this survey is possible introduction of selection bias. The respondents were clients of voluntary counselling and testing services who stated injecting drugs. The population represented by our sample cannot be identified. Study results are, therefore, only informative and cannot be generalized the broader population. Furthermore, this was a very small sample. IDUs represent a hard-to-reach population, which limits the number of individuals who are willing to participate in a study. Average annual number of registered treated IDUs during the study period was 7,700 (data from the Croatian National Registry of Treated Psychoactive Drug Addicts) and the estimated number of IDUs in Croatia is 15,444 (range 7,876–42,896) (18).

Despite this limitation, our results showed that drug injecting practices are strongly associated with hepatitis C. The frequency of sharing injection equipment was the most important factor in HCV transmission among Croatian IDUs. IDUs still represents a high-risk group with multiple risk factors for hepatitis C transmission. They not only have high HCV prevalence but also constitute a reservoir of HCV in the community. For these reasons, counselling and testing for HCV must be available for clients of programs for prevention and treatment of substance abuse. On the other hand, needle and syringes exchange programmes should be strengthen in order to decrease harm and burden of blood-borne viral diseases among people who inject drugs.

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