



Clinical Correlates of HCV Related Knowledge among Persons who Inject Drugs

Sercan Karabulut*

Department of Alcohol and Substance Addiction Treatment, Atatürk State Hospital, Antalya, Turkey

ABSTRACT

Introduction: Persons who inject drugs (PWID) are at high risk for infection with hepatitis C virus (HCV). A growing literature focused on interventions and treatment strategies, yet little is known about the factors related with HCV-knowledge.

Objectives: The goal of this study was assess the level of HCV-related knowledge among PWIDs and its correlates with high risk behaviors, especially sharing syringe and additional materials while controlling other significant clinical variables.

Methodology: We conducted interviews with PWIDs who consecutively admitted to outpatient treatment clinic (OAT) using a structured interview form, HCV knowledge assessment questionnaire, perception of severity, susceptibility and self-confidence scales, frequency of HCV risk behaviors scale and adult attention-deficit hyperactivity disorder self-report scale (ASRS).

Results: The current study explored correlates of HCV-associated knowledge among 101 patients. Findings indicated that filter sharing (OR=2.26, p=0.047), water sharing (OR=2.5, p=0.039), having tattoo/piercing (OR=2.27, p=0.013) and total score of ASRS (OR=0.08, p=0.038) were associated with HCV knowledge. After a second linear mixed model analysis, adjusting for risk factors, age and gender, only total score of ASRS predicted HCV knowledge (p=0.01).

Conclusion: Patients' knowledge about HCV was found to be significantly associated with attention-deficit hyperactivity disorder symptoms. Therefore clinicians who consider to treat HCV infection should evaluate clinical factors interrelated with knowledge that may affect treatment retention and distribution of illness.

Keywords: HCV; Knowledge; Correlate; ADHD

INTRODUCTION

Hepatitis C virus (HCV) infection among persons who inject drugs (PWID) is an ongoing epidemic worldwide as direct blood to blood contact is the most effective route of transmission [1,2]. Commonly accused transmission is high risk injection behaviors which include reusing syringes, sharing needles/syringes/drug preparation equipment and using nonsterile injection supplies [3,4]. High risk sexual behavior which includes multiple sex partners, condom less sex and condomless anal sex, also has been shown to be a risk factor

for HCV infection [5].

In addition to this, high proportion of substance users are unaware of their HCV infection status, and lack of heightened awareness and centers of screening anti-HCV contribute to the gaps in anti-viral treatments [6,7]. As a medical result, many older substance users are affected by long term consequences of HCV-induced liver disease which may lead to severe fibrosis and hepatocellular carcinoma [8]. Thus HCV is a major health problem in substance users that must be screened and treated with higher rates.

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Corresponding authors Sercan Karabulut, Department of Alcohol and Substance Addiction Treatment, Atatürk State Hospital, Antalya, Turkey, Tel: +905356127720; E-mail: drs_karabulut@hotmail.com

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In a lately presented study, financial barriers, distance to clinic, poor health status and HCV-related stigma were also all noted as barriers to HCV treatment [9]. However, since to a degree related with stigma and beyond its relation, lack of HCV-related knowledge plays an important role in lower enrollment rates [10,11]. Myths and incorrect information about HCV infection, (e.g. its asymptomatic nature may result under diagnosis of infection or earlier treatments including interferon based therapies which has been replaced with direct acting antivirals may be related with serious adverse effects) may effect patients' perception of disease and treatment. Defining knowledge level and its correlates may increase enrollment in HCV care [12,13]. In earlier studies investigating prevention program effects on HCV-related knowledge improvement showed that is drug users tend to have little patience, low self-esteem and lower levels of perception of HCV illness severity. So that these variables may be important to picture all dimensions of lack of knowledge [14,15].

Although there is inefficient data regarding Attention-Deficit Hyperactivity Disorder (ADHD) symptoms in PWIDs and Hepatitis C patients, an earlier study showed that impulsiveness was frequent in chronic Hepatitis C patients [16]. In a recent study from our group showed that more severe symptoms of ADHD may be related with more frequent is drug use.

Given that lack of knowledge may be playing an important role in under treatment and spread of HCV infection, it is important to assess HCV-related knowledge levels and its clinical correlates [17]. Thus, we designed a study which focuses on PWIDs, including those attending an acute detoxification program and those maintaining treatment for a while. We aimed to assess the level of HCV-related knowledge among PWIDs and its correlates with high risk behaviors, especially sharing syringe and additional materials while controlling the effect of age, gender and perception of illness severity, self-confidence and susceptibility. Our hypothesis was that lack of HCV-related knowledge may be interrelated with more frequent risky behaviors. We also wanted to evaluate the effect of is use characteristics (frequency, total duration of iv use, main reasons for iv use and sharing) and ADHD symptoms on these relationships and hypothesized that more frequent iv use and longer duration of iv use, impulsive sharing attitude may be related with lack of knowledge.

METHODS

Settings

This cross-sectional study was conducted in Ataturk State Hospital Substance and Alcohol Treatment Center (AMATEM), Antalya, Turkey between April and December 2021. This study protocol was reviewed and approved by the Ethics Committee of Antalya Research and Training Hospital, approval number 2021/326. All subjects were contacted by the author and written informed consent was obtained from all participants. The research was conducted ethically in accordance with the World Medical Association Declaration of Helsinki.

Sample

101 consecutively admitted patients with substance use disorder were considered for participation in the study. Ataturk State Hospital AMATEM is a specialized treatment clinic for patients in where outpatient and inpatient centers are available. All patients were evaluated in the Outpatient Treatment Center (OTC) and met the

criteria for at least one category of substance use disorders section according to DSM-5. Eligible for inclusion were patients who had injected drugs at least one time during the illness, were 18 years or older. Illiteracy, intellectual disability, having psychotic disorders or alcohol use disorder were exclusion criteria for the study. All patients were tested by using Anti-HCV ELISA screening test.

A structured data form was used within clinical examination, in which sociodemographic variables, parole/probation history, substance use history (number of substances used, frequency of use, route administration, last use time), tobacco products and alcohol use, syringe and paraphernalia use characteristics (syringe, cooker, spoon and filter sharing, frontload, backload, first use age of syringe, frequency of use and total duration of use, main reason for iv use and syringe/paraphernalia sharing), other risk factors (self-mutilative behaviors, having piercing/tattoo, risky sexual behavior, history of unprotected sex in men having sex with men), and antiviral treatment history were assessed.

Measures

Structured clinical interview for DSM-5 disorders: The substance use disorder section of the Structured Clinical Interview for DSM-5 Disorders Clinician Version (SCID-5-CV) was administered to all patients who were evaluated by trained psychiatrist (SK) in the Outpatient Treatment Center (OTC).

Adult attention-deficit hyperactivity disorder self-report scale: All patients applying OTC had been screened with Adult Attention-Deficit Hyperactivity Disorder Self-Report Scale (ASRS) for ADHD symptoms. ASRS is a self-report questionnaire which includes 18 questions about frequency of recent DSM-IV Criterion symptoms of adult ADHD. There are two sections; section A contains 6 questions, section B contains twelve questions. 6 of the 18 questions (Section A) were found to be the most predictive of symptoms consistent with ADHD. These 6 questions are the basis for the ASRS and part B of the scale contains the remaining 12 questions [18,19].

HCV knowledge assessment: Assessments were administered at OTC to all patients. HCV knowledge was assessed using a 20 items questionnaire. The questionnaire was adapted from Mayor et al., and evaluated knowledge about mode and routes of transmission, hepatitis and its liver damages, risky behaviors, prevention strategies and antiviral treatment [13]. Available responses on questionnaire were "True", "False" or "Don't know" and recoded as correct and incorrect, correct answers were summed to provide a total overall score measuring HCV knowledge.

Perception of severity, susceptibility and self-confidence assessment: Perception of severity assessment was conducted by using a 4 items survey that asked about severity of HCV infection and consequences including cirrhosis, hepatocellular carcinoma and death.

Perception of susceptibility assessment was conducted by using a 4 items survey that asked about routes of transmission. Item 1 included paraphernalia sharing, item 2 included back loading, item 3 included tattooing or having piercing, item 4 included unprotected sexual intercourse.

Perception of self-confidence assessment was conducted by using a 12 items survey that asked about prevention strategies which included how much they cared about using new syringes, water, cooker or cotton, cleaning the equipment. All items were rated on

a visual analog scale which ranged from 0 (not important) to 10 (very important).

Frequency of HCV risk behaviors assessment: The assessment of risk behavior frequency included an 8 items survey that asked about syringe and paraphernalia sharing, front loading, back loading and reuse of syringes. The frequency of HCV risk behaviors was measured on a scale ranging from “0” (never) to “10” (always).

Statistical Analyses

Frequency and percentage were used for sociodemographic analyses. Two separate regression models were used in the analysis to examine the relationship between HCV knowledge and clinical variables. The sum of true answers in HCV knowledge assessment was the main outcome. A fixed effect backward linear regression model was used as model 1. Clinical variables were selected as independent variables.

Linear mixed effect model was used in second model. Age, gender and related elements of syringe/paraphernalia sharing and total ASRS scores were forced into analysis as fixed effect independent variables. Since there was a between subject correlation between mean scores of perception, susceptibility, self-confidence assessment scales and frequency of HCV risk behaviors scales were included into analysis as random effect variables. All tests were two sided with significance set at $p < 0.05$. All statistical analyses were performed with SPSS (version 26.0, IBM).

RESULTS

Of 101 patients, majority of the group were male (90.1%). Over the half of patients were in low income group (52.5%). 49.5% of patients was unemployed and nearly 3/5th of the groups were secondary school graduate (8 years of schooling, 61.4%). Incarceration history was present in 75.2% of patients. 72.3% of patients were single.

All of the patients were heroin user (100%). Within two or more substance user group, second most used substance was cocaine (28.7%). The mean age of participants was 29.45 (\pm 6.8). The mean of total hospitalizations was 1.8 (\pm 2.7), of admissions to OTC was 2 (\pm 2.6). The mean age of first use of current substance was 18.8 (\pm 4.4) years. The mean age of first is substance use was 23.1 (\pm 5.3) years. The mean duration of the substance use was 37.3 \pm 36.2 months. The mean frequency of injection per week was 25.3 (\pm 24). Majority of the group were daily user (87%). 76.2% of patients had recently been injecting drugs. 90.1% of patients was Anti-HCV positive. Majority of patients were regular cigarette users (98%). Only 2% of patients were regular alcohol user.

73.3% of patients had used injector in last month. Rate of sharing of syringes was 61.4%, cooker was 63.4%, filter was 49.5%, front loading was 22.8%, back loading was 3%, and water was 59.4%. 26% had suicide attempts. 40.6% of patients had self-mutilative behaviors (cutting, burning, sticking one with needles, and severe scratching), 70.3% had piercing or tattoo. Risky sexual behavior (having multiple sexual partners, sexual intercourse with commercial sex workers, unprotected sexual intercourse) was determined in 36.6% of patients. The main reason for iv use was putting off the withdrawal symptoms (31.7%). The main reason for syringe/paraphernalia sharing was lack of sterile syringe and other stuff in case of impulsive substance use (62.4%) The mean of correct answer numbers of HCV acknowledge questionnaire was 9 (\pm 3.6). The most correctly answered item was “Sharing of syringe and/or paraphernalia (cooker, filter/cotton, water) increases HCV transmission risk.” (93.3%), (Table 1). The mean of perception of severity scale was 9.2 (\pm 1.5), of perception of susceptibility scale was 8.3 (\pm 2.2), of perception of self-confidence scale was 8.1 (\pm 2.1), frequency of HCV risk behaviors scale was 4.3 (\pm 3.1). The mean total score of ASRS was 32.7 (\pm 11.6), of ASRS-A was 11.1 (\pm 4.2), of ASRS-B was 21.5 (\pm 7.9). Of 101 patients, 29.7% had DAA treatment, 73.3% of the treatment receiving group completed the treatment.

Table 1: Proportion of Participants Correctly Answering Knowledge Questions

Questions	Answers (%)	
	Answered Correctly	Answered Incorrectly
The hepatitis C virus can survive in dried blood for up to 7 days.	15.6	15.6
All HCV-infected people have symptoms	32.2	15.6
An HCV vaccine is available	16.7	57.8
Hepatitis C is spread by coughing, sneezing, hugging or casual contact	62.2	13.3
People who contract hepatitis C usually feel sick within 1-2 days of contracting the virus.	31.1	25.6
Sharing of syringe and/or paraphernalia (cooker, filter/cotton, and water) increases HCV transmission risk.	93.3	1.1
HCV infection can cause death	78.9	10
It is dangerous to continue drinking alcohol after learning you have contracted hepatitis C.	60	4.4
You can kill Hepatitis C virus by cleaning a syringe with water	72.2	12.2
Most individuals with Hepatitis C exhibit no recognizable signs or symptoms.	47.8	7.8
Antiviral treatment for HCV maintains for years	20	43.3
You can be treated for hepatitis C but it is very hard to permanently cure	7.8	57.8
HCV is predominantly in blood	16.7	44.4
HCV is a viral condition	79.3	3.7
HCV is predominantly in urine, semen, stools	22	22
Getting tattoo under unhygienic conditions or performing unhygienic body piercing does not increase the risk of contracting the virus	48.8	12.2

Sharing razors with others increases the risk of contracting the virus	78	2.4
Men who have unprotected sex with other men are under risk of contracting the virus.	51.2	1.2
HCV infection can lead to cirrhosis	72	1.2
Not all HCV persons can receive HCV therapy	37.8	6.1

HCV: Hepatitis C Virus

In order to determine the relationship between risk factors, clinical variables and HCV knowledge; linear regression analysis was conducted. Filter sharing (OR=2.26, p=0.47), water sharing (OR=2.5, p=0.39), having tattoo/piercing (OR=2.27, p=0.13) and total score

of ASRS (OR=0.08, p=0.38) were associated with HCV knowledge.

In second analysis, linear fixed effect model analysis results showed that only total score of ASRS predicted HCV knowledge (p=0.01) (Table 2).

Table 2: Linear regression analyses of variables correlated with HCV-associated knowledge.

	Model 1 ^a		Model 2 ^b	
	OR (95 % CI) ^c	p value	Estimate (SE) ^d	p value
Cooker sharing	1.61 (0.46-3.68)	0.126	1.90 (1.13)	0.1
Yes				
No (reference)				
Filter/cotton sharing	2.26 (0.02-4.49)	0.047	2.30 (1.21)	0.062
Yes				
No (reference)				
Water sharing	2.50 (0.12-4.87)	0.039	1.84 (1.37)	0.184
Yes				
No (reference)				
Having tattoo/pier	2.27 (0.48-4.06)	0.013		
Yes				
No (reference)				
Total score of ASRS	0.06 (0.01-0.14)	0.038	0.10 (0.04)	0.013
Age			0.02 (0.06)	0.672
Gender			0.22 (1.74)	0.896
Male				
Female (reference)				
Syringe sharing			0.14 (1.07)	0.897
Yes				
No (reference)				
Front loading			0.92 (1.08)	0.395
Yes				
No (reference)				
Back loading			3.00 (2.65)	0.262
Yes				
No (reference)				

HCV: Hepatitis C Virus, ASRS: Adult attention-deficit hyperactivity disorder self-report scale

^aR²=0.21, Durbin Watson =2.238. Backward linear regression.

^bLinear mixed model. Age, gender and related elements of syringe/paraphernalia sharing and total ASRS scores were forced into analysis as fixed-effect independent variables. Mean scores of perception, susceptibility, self-confidence assessment scales and frequency of HCV risk behaviors scales were included into analysis as random-effect variables.

^cConfidence Interval, ^dStandard Error.

DISCUSSION

Consistent with previous research, participants in this study did not have accurate information regarding risk of HCV transmission, prevention strategies and knowledge of new treatments [11,20].

Although HCV transmission with syringe sharing was known in a majority of the group, filter and water recipients sharing were associated with lower hepatitis C associated knowledge in our study. We also found out that the main reason why patients shared syringe/paraphernalia was lack of syringe and other equipment. There are several potential reasons why knowledge about HCV transmission differs in terms of equipment. Firstly, potential lack of knowledge including health professionals might contribute, since previous studies showed that PWIDs reported not receiving clear messages regarding basic HCV knowledge from health providers [21]. On the other hand, lack of Syringe Services Program (SSP) in Turkey may play another important role in the problem. In earlier studies, SSP clients reported to reduce injection risk behaviors. Increasing syringe coverage was shown to be associated with sharing injection equipment and reusing syringes [4,22]. Moreover injecting in public was associated with increased HCV infection risk and syringe sharing, suggesting that additional interventions (e.g. SSPs, housing) may be needed to reduce injection risk behaviors among PWIDs [23,24].

To our knowledge, this is the first study investigating ADHD symptoms effect on HCV-associated knowledge. Patients with ADHD symptoms were associated with lower knowledge in our study. Assessing the causality link, in previous studies ADHD had been significantly associated with a propensity to experiment with illicit substances, especially at earlier ages, to exhibit risky substance use patterns and to subsequently develop substance use disorders [25,26].

Impulsivity/hyperactivity which was associated with risky daily behaviors may also be related with risky injection behaviors [27]. Attention problems which were related with earlier age of first illicit drug use and heavier use could be interrelated with lack of knowledge [28]. In consistent with these reports, our study found out that total ASRS scores predicted lower knowledge in regression models.

Tattoos have been becoming popular among young people, as they have become recognized as a means of self-expression [29]. Tattooing is an invasive procedure that involves the injection of pigmented particles into the dermal layer of the skin through repeated skin punctures. Therefore, it poses a potential risk of infection by diverse microorganisms if the ink or instrument used for tattooing is reused without a proper disinfection procedure [30]. Some systematic reviews and meta-analyses have reported that tattooing in certain groups could increase the risk of HCV transmission [31,32]. PWIDs and prisoner groups were shown to be higher likelihood of having HCV infection among subjects with tattoos. In the light of these well-known literature, prisoners and IV drug users who might have been exposed to an unsafe environment during tattooing could contribute to the increased prevalence of HCV, and our results showed that having tattoo in PWIDs was associated with lower knowledge [33].

In a study in Australia, prisoners who have piercing were reported to be significantly higher likelihood of contracting HCV infection [34]. Consistent with these, in the present study having piercing

was associated with lower knowledge. However, these results should be viewed with caution, as risk of transmission may rather be related with imprisonment.

This study has a number of limitations. Firstly, given the great number of true items in the knowledge questionnaire there is potential for affirmative response bias with this measure. Future studies are needed to update and validate this knowledge scale. Secondly, ADHD symptoms were screened in this study, however a clinician performing diagnostic interview such as SCID-5-CV for accurate diagnosis could have been more valuable. Although a heterogeneous patient group was targeted to be included into the study, our findings may not be generalizable to patients who had not admitted to OTC for treatment. Thus field studies including public based screening (e.g. rapid Anti-HCV test) may bring different perspectives.

CONCLUSION

In conclusion, analysis of factors from PWID group allows the identification of HCV-associated knowledge levels and its correlates. ASRS scores were the most significant variable associated with HCV-related knowledge. So that clinicians should consider spending time elucidating ADHD symptoms and treatment. As syringe and paraphernalia sharing was previously shown to be an important part of the virus transmission, filter/cotton and water sharing seems to have an important role among this equipment. Especially PWIDs who had imprisonment history should be evaluated in terms of having piercing or tattoo. So that in future studies, prevention programs should be integrated to outpatient treatment programs considering these findings.

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AVAILABILITY OF DATA AND MATERIAL

The datasets generated during and/or analysed during the current study are not publicly available due to principle of confidentiality but are available from the corresponding author on reasonable request

AUTHOR'S CONTRIBUTIONS

Sercan Karabulut contributed to all parts of the research and preparation of the manuscript.

COMPETING INTERESTS

The author has no relevant financial or non-financial interests to disclose.

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