Visits to primary care physicians among persons who inject drugs at high risk of Hepatitis C Virus infection: room for improvement

Andreea Adelina Artenie, MSc [1,2], Didier Jutras-Aswad, MD, MSc [1,3], Élise Roy, MD, MSc [4,5], Geng Zang, MSc [1], Jean-Marie Bamvita, PhD [1], Annie Lévesque, MD [1,2], Julie Bruneau, MD, MSc [1,2,6]

Affiliations:

1. Research Center, Centre Hospitalier de l'Université de Montréal (CRCHUM), Montréal, Québec, Canada
2. Department of Family Medicine, Faculty of Medicine, McGill University, Montréal, Québec, Canada
3. Department of Psychiatry, Faculty of Medicine, Université de Montréal, Montréal, Québec, Canada
4. Addiction Research and Study Program, Faculty of Medicine and Health Sciences, Université de Sherbrooke, Longueuil, Québec, Canada
5. Montréal Public Health Department, Agence de la santé et des services sociaux de Montréal, Montréal, Québec, Canada.
6. Department of Family and Emergency Medicine, Faculty of Medicine, Université de Montréal, Montréal, Québec, Canada.

Contact Information (Corresponding Author):

Julie Bruneau, MD, MSc

Research Center, Centre Hospitalier de l'Université de Montréal (CRCHUM)

Tour Saint-Antoine

850, Saint-Denis, office S02-810

Montréal, QC H2X 0A9

Canada

Phone: +1 (514) 890-8000 Ext. 35713 · Fax: +1 (514) 412-7280

E-mail: julie.bruneau@umontreal.ca

Abstract and keywords

Abstract: The role of primary care physicians (PCP) in Hepatitis C Virus (HCV) prevention is increasingly emphasized. Yet, little is known about the patterns of contacts with PCP among persons who inject drugs (PWID). We sought to assess the six-month prevalence of PCP visiting among PWID at risk of HCV infection, and to explore the associated factors. Baseline data were collected from HCV-seronegative PWID recruited in HEPCO, an observational Hepatitis Cohort study (2004-2011) in Montreal, Canada. An interviewer-administered questionnaire elicited information on socio-demographic factors, drug use patterns, and health care services utilization. Blood samples were tested for HCV antibodies. Using the Gelberg-Andersen Behavioral Model, hierarchical logistic regression analyses were conducted to identify predisposing, need and enabling factors associated with PCP visiting. Of the 349 participants (mean age=34; 80.8% male), 32.1% reported visiting a PCP. In the multivariate model, among predisposing factors, male gender (Adjusted Odds Ratio [AOR]=0.45, [0.25-0.83], chronic homelessness (AOR=0.08, [0.01-0.67]), cocaine injection (AOR=0.46, [0.28-0.76]) and reporting greater illegal or semi-legal income (AOR=0.48, [0.27-0.85]) were negatively associated with PCP visits. Markers of need were not associated with the outcome. Among enabling factors, contact with street nurses (AOR=3.86, [1.49-9.90]) and food banks (AOR=2.01, [1.20-3.37]) were positively associated with PCP visiting. Only one third of participating PWID reported a recent visit to a PCP. While a host of predisposing factors seems to hamper timely contacts with PCP among high-risk PWID, community-based support services may play an important role in initiating dialogue with primary health care services in this population.

Keywords: hepatitis C, drug use, injection, primary care, physician

Abbreviations

HCV: Hepatitis C Virus

HIV: Human Immunodeficiency Virus

NEP: needle exchange programs

PCP: primary care physician

PWID: persons who inject drugs

Introduction

In developed countries, illicit injection drug use is at the core of the Hepatitis C epidemic, accounting for the majority of new (80%) and existing (60%) infections (1, 2). Currently, there is no vaccine available to confer protection against infection with Hepatitis C Virus (HCV) (3), and therefore, prevention is dependent upon efforts to decrease transmission rates among high-risk persons. Recent guidelines issued by the Centers for Disease Control and Prevention (CDC) in the United States recommend the provision of a comprehensive HCV prevention approach, involving multiple, combined strategies, among persons who inject drugs (PWID) (4).

Chronic disease prevention is an integral component of primary health care services, and primary care physicians (PCP) have a well-established role in offering preventive care for chronic illnesses such as type II diabetes, cardiovascular diseases, and alcohol use disorders (5, 6). Increasingly emphasized is the role that PCP may play in curbing the HCV epidemic through key HCV prevention interventions, including screening, counseling and testing (7, 8). These strategies are recommended by the United States CDC on a regular basis among high-risk persons (4), as they are shown to reduce risky injection behaviors (9, 10). Yet, a considerable proportion of PWID are not aware of being infected (11), and patients without a regular source of care are nearly 20 times more likely to be unaware of their infection (12). Further, as HCV therapy can reduce the reservoir of HCV-infected PWID and prevent further infections, the value of treatment as prevention is increasingly recognized (13). With the advent of well-tolerated, orally administered HCV treatment regimens (14), it is likely that PCP will be able to effectively deliver HCV therapy as part of integrated health care settings (15).

Despite being at high risk of HCV infection (16), PWID are less likely to benefit from primary preventive health care compared to the general population (17). A complex interplay of

factors is known to be at the root of health care services use, in general, among PWID, ranging from individual circumstances to provider- and system-related factors (18-21). Little is known, however, about the factors influencing visits to PCP in this population. In West Yorkshire, England, fear of negative provider attitudes and difficulties travelling to services among those living in rural areas were reported as barriers by PWID trying to secure primary health care (22). Conversely, contact with needle exchange programs (NEP) among PWID in Baltimore was identified as a significant facilitator to primary health care visits (23).

In an effort to enhance our understanding of the patterns of contacts with primary health care services among PWID at risk of HCV infection, and help direct efforts toward improving HCV prevention in this population, we examined the six-month prevalence of visiting a PCP, and factors that may deter or enhance visits in a sample of HCV-seronegative PWID living in a large, urban Canadian city.

Methods

Study population

The study population was drawn from the Saint- Luc Cohort, an open cohort of PWID established in Montreal in 1988 to study determinants of Human Immunodeficiency Virus (HIV) transmission. In 2004, the study's objectives were expanded to include a focus on determinants of HCV, and the HEPatitis COhort (HEPCO), an embedded cohort of HCV-seronegative PWID, was constituted. To be eligible for recruitment into HEPCO, participants are required to be current PWID (i.e., having injected drugs within the previous six months), be negative for HCV infection, and at least 18 years of age.

A detailed description of the recruitment and follow-up procedures has been previously published (24). HEPCO includes HCV-seronegative participants already followed in the Saint-

Luc cohort (30%), as well as new participants recruited through street-level strategies such as word-of-mouth (36%) or through community program referrals (34%). All participants signed an informed consent in compliance with institutional review board regulations of the Centre Hospitalier de l'Université de Montréal (CHUM).

We used baseline data collected from 349 HCV-seronegative HEPCO participants recruited between November 2004 and March 2011. At enrollment, an interviewer-administered questionnaire elicited information on socio-demographic factors, patterns of drug use and related behaviors, health status and health care services utilization. Venous blood samples were collected for HCV testing. Participants were encouraged to return for their test results two weeks post-interview, at which time appropriate counseling and referrals were provided. A CAD 15.00$ stipend was offered to all participants upon completion of the questionnaire, as compensation for their time. This study was approved by the Ethics Committee of the Centre de Recherche du CHUM.

Measures

The outcome variable was a self-reported dichotomous measure of having visited one or more PCP in a public or private-funded clinic in reference to the previous six months. All PCP visits in Montreal are entirely covered by the provincial health insurance. To guide variable selection and classification, we relied on the Gelberg-Andersen Behavioral Model for Vulnerable Populations (25). This framework has provided a foundation for studies of utilization of out-patient medical care (26), antiretroviral treatment for HIV (27) and drug treatment (28) among vulnerable groups. According to the model, an individual's use of health care services is a function of three factors: predisposing, need and enabling. Predisposing factors refer to an individual's general propensity to seek health care services. Need characteristics reflect an

individual's health status and perception of illness. Enabling factors include community resources that enable individuals' access to needed health care services.

Predisposing factors included age, gender and education, and markers of vulnerability that are relevant to the study population such as chronic homelessness, intravenous cocaine use and reporting a greater proportion of the income coming through unstable sources. Consistent with the definition given by the Substance Abuse and Mental Health Services Administration (29), chronic homelessness was defined as sleeping in shelters every night for the past six months. Participants were considered to have greater unstable income if they reported obtaining greater income through semi-legal (e.g., prostitution, panhandling) or illegal (e.g., selling drugs) sources than through regular, legal employment positions or governmental benefits. Need factors were assessed by means of perceived health status and reports of being sick. Enabling factors included contacts with community-based support programs such as street nurses, recovery centers for drug misuse, NEP and food banks.

Statistical analyses

We used descriptive statistics (i.e., means, standard deviations (SD) and frequency distributions) to characterize the study population, and bivariate logistic regression analyses to examine the association between visits to PCP and each correlate. To explore factors that were independently associated with PCP visits, and to determine the influence of each of the three predictor domains on the outcome, we constructed a hierarchical multivariate logistic regression model, whereby blocks of variables, informed by our conceptual framework, were entered in a sequential manner (30). Specifically, predisposing variables were entered first and were followed, sequentially, by need, and enabling factors. Each time a set of variables of a particular domain was entered, we chose the most parsimonious model ($p<0.1$) through a process of

stepwise backward elimination, and then the next set of variables was entered. The variables age and gender were forced into the multivariate models. The change in the -2 log likelihood statistic, induced by the addition of each variable block, was indicative of the relative contribution made by that specific predicting domain (30). Model fit was assessed using the likelihood ratio test. All analyses were performed using SAS® v 9.3 (SAS Institute, Cary, North Carolina, United States).

Results

At enrollment, participants' mean age was 34 (SD= 9.6) and 80.8% were male. A minority reported having completed a college education (16.0%) and being chronically homeless (6.9%). One hundred and twelve (32.1%) reported visits to a PCP in the previous six months.

Table 1 presents descriptive and bivariate logistic regression analyses between PCP visits and each correlate. Among predisposing factors, male gender, chronic homelessness, cocaine injection and reporting greater unstable income were negatively associated with PCP visits. Perceived health and reports of being sick, markers of need, were not associated with the outcome. Among enabling factors, contact with street nurses and contact with food banks were positively associated with visits to PCP.

Results from the hierarchical multivariate logistic regression model are presented in Table 2. Compared to the intercept-only model, the introduction of the predisposing domain in Model A significantly improved model fit, as illustrated by the likelihood ratio test ($p<0.0001$). Male gender, chronic homelessness, cocaine injection and reporting a greater proportion of the income coming through unstable sources remained independently associated with visiting a PCP. Need variables did not meet the criterion for retention into the multivariate model (i.e., $p<0.1$) and thus, Model B yielded results identical to Model A. The addition of the enabling set of

variables in Model C significantly improved model fit ($p<0.0001$). Contact with street nurses and contact with food banks remained independently associated with visiting a PCP.

In the final multivariate model, variables that remained significantly associated with PCP visits included male gender, chronic homelessness, cocaine injection, reporting greater income through unstable sources, contact with street nurses and contact with food banks.

Discussion

Our study documents a low proportion of recent visits to a PCP among HCV-seronegative PWID. Only one third of participants reported having visited a PCP in the previous six months. In contrast, nationwide surveys conducted in Canada (31) and the United States (32) noted that over 90% of Canadians and 67% of Americans have a regular source of health care. Previous research conducted in Florida illustrated that, compared to non-drug users, PWID are nearly half as likely to receive a routine physical exam (17). Altogether, these findings suggest that PWID are substantially less likely to benefit from primary, preventive health care, as delivered by PCP, despite their elevated risk of morbidity and mortality (33), even when covered by a universal health insurance plan.

Given an estimated HCV incidence rate as high as 25 per 100 person-years among recent-onset injectors (34), there is a narrow window of opportunity to intervene. It has been postulated that current harm reduction programs, although effective, may not reach PWID early enough in their ‘injecting careers’ to optimally impact HCV transmission (35). Timely contacts with PCP presents an opportunity to intervene early by offering HCV screening, counseling and testing, hence also a venue for evaluation and intervention for drug misuse (36) and continuity of care, strategy that is key to an effective HCV prevention approach (4).

Following the Gelberg-Andersen Behavioral Health Model, our study indicates that several predisposing and enabling factors, but not need, may be important in shaping the patterns of contacts with PCP among HCV-seronegative PWID. Among predisposing factors, male gender correlated with lower odds of visiting a PCP, finding that is consistent with the broader literature characterizing gender differences in health-seeking behaviors (37). Cocaine injectors were found to be significantly less likely to have visited a PCP. Similarly, PWID who are chronically homeless and those who rely heavily on inconsistent income-generating sources had significantly reduced odds of reporting visits to a PCP. These findings are open to several interpretations. Injection of cocaine has been associated with compulsive drug-seeking behaviors and reduced concerns about self-care (38, 39), thus raising the possibility that the observed negative association with PCP visiting may be a reflection of their more drug-affected lifestyle. PWID who are homeless and who draw substantially from semi-legal and illegal income sources are exposed to risk environments previously shown to be associated with poorer health status and outcomes among drug-using populations (40). Hence, drug procurement, seeking basic survival needs and generating revenue for drug expenses may take priority over obtaining timely, preventive health care among these injector sub-groups. Conversely, our findings could also reflect a level of reluctance among more disadvantaged sub-groups of PWID to seek help from PCP because of anticipated stigma or previous discriminating experiences. An abundant literature has documented the stigma that PWID are frequently faced with during encounters with health care providers, in particular non-addiction specialists such as PCP, and its negative impact on this population's use of health care services (20-22).

The absence of a statistically significant association between need factors and PCP visiting can be seen through a similar lens. Previous research has shown that PWID often

postpone seeking needed care until their conditions become severe, at which point they rely on acute health care services (41) . Likewise, this finding could also reflect fear of judgmental attitudes and mistrust in the knowledge and capacity of PCP to address the complex health and social needs commonly accompanying injection drug use. Indeed, these perceptions may have had a negative impact on PWID's patterns of visits to PCP to the point of rendering need insignificant (20, 22). Surveys conducted among PCP illustrated a number of potential knowledge deficits in relation to HCV identification and management (42, 43), which has not gone unnoticed among PWID (44). Research has indicated, however, that PCP are willing to take on a greater role in HCV prevention and care, though additional support for HCV evaluation and management is needed (45). To this end, increasing evidence is illustrating that relatively simple interventions, such as clinical reminders, can be helpful in improving HCV screening and testing rates in primary health care settings (46).

Our study identified certain interventions that could serve to increase engagement in primary care among PWID at risk of HCV infection. We noted that, among enabling factors, contacts with food banks and street nurses were associated with two, and nearly four fold greater odds of reporting visits to a PCP, respectively. This finding is consistent with previous research showing that community-based outreach models can play a key role in engaging vulnerable and hard-to-reach populations into primary care (47). Interactions with community-based organizations are often perceived as being more trustful and less discriminating by PWID (44), and the importance of a trusting relationship between the patient and health care professional as a means of encouraging engagement in care in this population has been well documented (48). Hence, contacts with food banks and street nurses may serve as an opportunity to attract and engage "hard-to-reach" individuals, and to provide facilitated linkage to PCP who are likely to

care for drug-using populations. In contrast to findings reported previously in Baltimore (23), contact with NEP was not associated with PCP visiting in our study. Typically, in Montreal, NEP do not have PCP directly affiliated to their service and working on-site. Further, in contrast to outreach nurses and food banks, which generally provide services to PWID during daytime, NEP operate mostly at night, which may result in fewer opportunities to establish direct linkage to PCP. Altogether, our findings suggest that low-threshold services, by and large, could play an important role in initiating dialogue between PWID and primary health care services. Strategies to improve direct linkage between NEP and PCP services should be examined.

Our study presents strengths and limitations. This investigation had a focus on an HCV-seronegative sample of PWID, which constitutes a focal target group of HCV-prevention strategies. In addition, the study was conducted in a large, cosmopolitan North-American city, and thus, it may reflect patterns of contacts with PCP among PWID in similar settings. However, given the cross-sectional nature of our study, the temporality of associations cannot be established. Further, while socio-demographic characteristics are, by and large, reflective of the PWID population in Quebec (49), the HEPCO cohort is not a random sample, thereby limiting the generalisability of our findings. As in all studies involving PWID, social desirability bias might arise as a result of eliciting information on socially sensitive behavior, although research has indicated that self-reported data collected from drug-using populations are, by and large, reliable and valid (50). Lastly, this study relied on secondarily collected data and therefore, other potentially important correlates of PCP visits, such as PWID's attitudes toward PCP, have not been explored.

In conclusion, although timely visits to PCP may provide an opportunity for HCV prevention among HCV-seronegative PWID, our results indicate that this opportunity is

frequently missed. As several factors seem to play a role in shaping the patterns of contacts with PCP in this population, multiple approaches to promote engagement in care are needed. For one, efforts should attend to the broader contextual environment of PWID. Supportive services addressing difficulties such as homelessness and lack of a stable employment may give PWID the needed stability to be able to focus on their health problems or seek preventive care. Further, promoting targeted skill-building training for PCP, as it has been consistently emphasized in previous work, could potentially have considerable impacts on their willingness to promote and provide timely preventive health care to PWID. In parallel, exchanges with community-based support services, including outreach nurses, could serve as a valuable strategy to open up dialogue between PCP and this vulnerable population, though further research in exploring this matter is needed.

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Table 1: Descriptive characteristics, unadjusted odds ratios (UOR) and corresponding 95% Confidence Intervals (CI) for visiting a primary care physician (PCP) according to predisposing, need and enabling factors among 349 HCV-seronegative persons who inject drugs

Variable	Category	Total N=349 n (%)	Visited a PCP (N=112) n (%)	UOR	95% CI
Predisposing factors					
Age	Mean (SD[+])	34.1 (9.6)	34.5 (10.1)	1.06	0.84 - 1.34
Gender	Male	282 (80.8)	78 (69.6)	0.37	0.22 - 0.64
	Female	67 (19.2)	34 (30.4)	Ref	
Married/common law	Yes	34 (9.7)	16 (14.3)	2.03	0.99 - 4.15
	No	315 (90.3)	96 (85.7)	Ref	
Completed college education	Yes	56 (16.0)	22 (19.6)	1.46	0.81 - 2.64
	No	293 (84.0)	90 (80.4)	Ref	
Chronically homeless [a]	Yes	24 (6.9)	1 (0.9)	0.08	0.01 - 0.63
	No	325 (93.1)	111 (99.1)	Ref	
Cocaine injection [b]	Yes	210 (60.2)	52 (46.4)	0.43	0.27 - 0.69
	No	139 (39.8)	60 (53.6)	Ref	

Unstable income > stable income [a]	Yes	117 (33.5)	27 (24.1)	0.52	0.32 - 0.86
	No	232 (66.5)	85 (75.9)	Ref	
Need factors					
Perceived health	Excellent/ good	247 (70.8)	72 (64.3)	0.64	0.39 - 1.03
	Fair/poor	102 (29.2)	40 (35.7)	Ref	
Having been sick [a]	Yes	157 (45.0)	55 (49.1)	1.28	0.81 - 2.01
	No	192 (55.0)	57 (50.9)	Ref	
Enabling factors					
Contact with street nurses [a]	Yes	24 (6.9)	12 (10.7)	2.25	0.98 - 5.18
	No	325 (93.1)	100 (89.3)	Ref	
Contact with recovery centers for drug misuse [a]	Yes	47 (13.5)	22 (19.6)	2.07	1.11 - 3.87
	No	302 (86.5)	90 (80.4)	Ref	
Contact with needle exchange programs [a]	Yes	203 (58.2)	70 (62.5)	1.30	0.82 - 2.07
	No	146 (41.8)	42 (37.5)	Ref	
Contact with food banks [a]	Yes	101 (28.9)	47 (42.0)	2.45	1.51 - 3.97

No	248 (71.1)	65 (58.0)	Ref

[+]SD: Standard deviation

[a] Refers to behaviors in the past six months

[b] Refers to behavior in the past month

Table 2: Adjusted odds ratios (AOR) and 95% Confidence Intervals (CI) for visiting a primary care physician according to predisposing, need and enabling factors, among 349 HCV-seronegative persons who inject drugs

Variable	**Model A** (Predisposing factors) AOR (95% CI)	**Model B** (Predisposing and need factors) AOR (95% CI)	**Model C** (Predisposing, need and enabling factors) AOR (95% CI)
Age (10-unit increments)	1.14 (0.88 - 1.49)	1.14 (0.88 - 1.49)	1.12 (0.86 - 1.47)
Male gender	0.41 (0.23 - 0.74)**	0.41 (0.23 - 0.74)**	0.45 (0.25 - 0.83)*
Chronically homeless [a]	0.09 (0.01 - 0.72)*	0.09 (0.01 - 0.72)*	0.08 (0.01 - 0.67)*
Cocaine injection [b]	0.50 (0.31 - 0.80)**	0.50 (0.31 - 0.80)**	0.46 (0.28 - 0.76)**
Unstable income > stable income [a]	0.54 (0.32 - 0.93)*	0.54 (0.32 - 0.93)*	0.48 (0.27 - 0.85)*
Contact with street nurses [a]	-	-	3.86 (1.49 - 9.90)**
Contact with food banks [a]	-	-	2.01 (1.20 - 3.37)**
-2 log likelihood	397.35	397.35	381.83
Δ -2 log likelihood	39.12	0	15.52
p-value [+]	<0.0001	-	<0.0001

[+] *p*-value according to the Likelihood ratio test

[a] Refers to behaviors in the past six months

[b] Refers to behavior in the past month

[*] If $p<0.05$; [**] if $p<0.01$