THE SOCIAL DETERMINANTS OF EMERGENCY DEPARTMENT AND HOSPITAL USE BY INJECTION DRUG USERS IN CANADA

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ABSTRACT

Objective. The aim of this study was to describe the relationship between sociodemographic characteristics and human immunodeficiency (HIV) status of a cohort of injection drug users (IDUs) on their self-reported health service utilization.

Design. Interviewer-administered questionnaire.

Methods. IDUs who had injected illicit drugs within the previous month were recruited through street outreach. They underwent serology for HIV-1 and questionnaires on demographics, drug using behaviors, housing status, and health service utilization (hospitalization overnight and emergency department visits) in the previous 6 months. Logistic regression analysis was used to identify independent associations with the use of health services.

Results. Of 1,103 cohort participants, 65% were male, 63% were white, and 23% were HIV positive. Cocaine was the most frequently injected drug used. Almost half (47%) had used health services in the previous 6 months. The following variables were associated independently with health service utilization (adjusted odds ratio; 95% confidence interval): unstable housing, defined as living primarily in a hotel, boarding room, or transition house or on the street in the past 6 months (1.44; 1.11–1.86); female gender (1.45; 1.11–1.89); HIV-

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positive status (1.43; 1.06–1.92); injection of cocaine (1.50; 1.12–2.02); and primary care physician visit in past 6 months (1.91; 1.39–2.64).

Conclusion. IDUs with unstable housing were more likely to report emergency department and hospital use, which may be a reflection of their disorganized lifestyle or poorer health status. Further studies are required to assess the effect on the health status and health care use of IDUs of interventions that increase the availability of safe, affordable housing.

KEY WORDS Canada, Drug Users, Health Services Utilization, Hospitalization, Housing

INTRODUCTION

Injection drug use is a growing social, economic, and public health problem both internationally and in Canada.[1,2] The prevalence and incidence rates of human immunodeficiency virus (HIV) among a prospective cohort of injection drug users (IDUs) in Vancouver, Canada, were 25% and 18.6 per 100 person-years, respectively,[3] This serious HIV outbreak has peaked the concern of public health officials locally and nationally.[2,4] Given these observations, it is only natural to expect that the health care burden of IDUs will continue to increase.

Little research has been conducted on the health care utilization patterns of IDU populations. Cohort studies of IDUs in the US and the Netherlands have shown that mortality in IDUs is predominantly due to overdoses, suicide, and liver failure due to hepatitis, even among those infected with HIV.[5,6] These studies have demonstrated a significant pre-AIDS (acquired immunodeficiency syndrome) mortality, suggesting that a significant proportion of health care costs are incurred before AIDS has developed in this group.[7] With respect to resource utilization, studies in the US have shown that persons who were non-white, female, or an IDU had higher rates of emergency department use.[8] These findings, however, may not be generalizable to IDUs who have access to universal health care. To address this, we examined the health services utilization among a cohort of IDUs in a health care setting in which primary care and antiretroviral therapy are available free of charge.[9] The objective of this cross-sectional analysis was to describe the relationship between baseline sociodemographic characteristics, HIV status, and self-reported utilization of health services among IDUs participating in a prospective cohort study.

METHODS

Study Sample

Beginning May 1996, persons who had injected illicit drugs at least once in the previous month and who resided in the Greater Vancouver region were recruited into the Vancouver Injection Drug User Study (VIDUS). The study established a

storefront office in the downtown east side of Vancouver. Most of the participants (82%) came to the study office having learned of the study through recruitment materials or other participants. The remaining participants were referred by the needle-exchange program (5%), other storefront agencies (10%), and clinics (3%). Evidence of recent injection drug use was required by inspection of needle tracks. Participants provided blood samples for HIV and hepatitis C virus antibody testing, and underwent an interview-administered questionnaire at the baseline visit and semiannually thereafter. Blood specimens reactive on enzyme-linked immunosorbent assay were confirmed by Western blot. Participants were reimbursed $20 (Canadian) for each study visit, at which time referrals were provided for universal medical care, HIV/AIDS care, available drug and alcohol treatment, and counseling.

Survey Instrument

Trained interviewers who were blind to the HIV serostatus of the participants administered the questionnaires. They collected detailed information on demographics, drug and sexual behaviors, types of and frequency of drugs used, incarceration, housing, methadone maintenance, and the utilization of health services such as emergency department, clinics, and hospitalization in the previous six months. Examples of the specific questions in terms of health service use were: "In the previous six months, have you been at an emergency department at a hospital? In the previous six months, have you been admitted at a hospital overnight or longer?" The St. Paul's Hospital Ethics Committee for Human Experimentation approved this study.

Statistical Analysis

We defined the use of health services as any self-reported visit to the emergency department or hospitalization overnight in the previous 6 months. The two types of service use were combined as we perceived them to represent urgent types of care. We used contingency table analysis to determine if associations existed between users and nonusers of services on the basis of the baseline sociodemographic and behavioral characteristics. As in previous analyses,[3,10] unstable housing was defined as living in the past 6 months in a hotel with single-occupancy rooms, boarding room, hostel, transition house, or jail or on the street. Wilcoxon rank sum tests were used to compare continuous variables.

We assessed the relationship between each predictor variable and self-reported health service use at baseline using logistic regression. To identify independent predictors of health care utilization, variables that were significant at the 5%

level in the bivariate models were offered into multivariate models in a stepwise, hierarchical fashion. In the final model, all relevant two-way interactions were considered.

We examined the validity of self-reported utilization by non-nominal record linkage of the self-reported hospitalization in the previous 6 months with the administrative data from the Ministry of Health hospital separations file on a subsample of the study population (n = 152). We found an overall 75% agreement (77% for those who reported no hospitalization and 71% who reported hospitalization) between self-reports and the administrative data ($P = .37$). The kappa statistic, which reflects agreement beyond chance, was 0.47 (95% confidence interval 0.27–0.67).

RESULTS

As of September 1997, 1,103 eligible IDUs had completed baseline interviews and provided blood specimens for HIV antibody testing. The group was predominantly male (66%) and white (63%), and the median age was 35 years. A total of 250 participants were HIV positive at baseline (23%), and cocaine was the most frequently injected drug. Of the participants, 47% reported the use of either the emergency department or hospital services in the previous 6 months. Almost half (45%) reported using the emergency department only, and 21% had been hospitalized via the emergency department. Only 11% of participants were enrolled in a methadone maintenance program, and less than a quarter of participants were enrolled in a drug or alcohol treatment program.

Table I presents the sociodemographic profile of the participants by their health service use. A higher proportion of females used emergency and hospital services ($P < .001$). A greater proportion of IDUs who used health services reported unstable housing, such as single-occupancy hotel rooms (66% vs. 57%, $P = .002$). There were no differences in the proportion who were incarcerated or who had full-time employment or an illegal income in the previous 6 months by their health service use.

Baseline HIV prevalence was also higher in the group who used services. Over half (62%) of the HIV-positive IDUs were aware of their serostatus, and those who were HIV positive were more likely to use medical services compared to those who were not. The median CD4 counts among HIV-infected participants who did and did not use services were 368 mm^3 versus 310 mm^3, respectively ($P = .17$). In terms of other indicators of health status, we found no difference by health service use in the proportion who were hepatitis C positive, tuberculosis

TABLE I Demographic and Health Status Characteristics of Injection Drug Users by Health Service Use (N = 1103)

Variable	No (n = 586), N (%)	Yes (n = 517), N (%)	Total (N = 1,103), N (%)	*P*
Gender				
Male	419 (71)	304 (59)	723 (66)	<.001
Female	169 (29)	210 (41)	379 (34)	
Ethnicity				
White	354 (60)	336 (65)	690 (63)	.31
Native	146 (25)	135 (26)	281 (26)	.85
Other	88 (15)	43 (9)	131 (12)	<.001
Age median (IQR)*	35 (28–41)	34 (27–40)	35 (27–41)	.031
Education (less than high school)	480 (82)	419 (81)	899 (81)	.66
Unstable housing	334 (57)	340 (66)	674 (61)	.002
Illegal income	80 (14)	74 (15)	154 (14)	.673
Full-time employment	31 (5)	21 (4)	52 (5)	.354
HIV+	106 (18)	144 (28)	250 (23)	<.001
Aware of HIV+ status	66 (16)	90 (23)	156 (62)	.012
Hepatitis C positive	486 (84)	429 (87)	904 (85)	.167
Positive TB skin test	72 (19)	57 (18)	129 (18)	.789
History of sexually transmitted disease	231 (39)	227 (44)	458 (42)	.096
History of mental disability/disorder	115 (20)	138 (27)	253 (23)	.004
History of endocarditis †	4 (0.7)	34 (7)	38 (3)	.001
History of abscess†	24 (4)	49 (9)	73 (3)	.001
Primary care visit†	428 (73)	434 (85)	862 (79)	.001

Interquartile range.
†In the past 6 months.

skin test positive, or who had a history of sexually transmitted disease. IDUs who used emergency or hospital services were more likely, however, to report a history of mental disability/disorder, endocarditis, or abscesses and to have seen a primary care physician in the past 6 months.

A higher proportion of service users reported injecting cocaine (Table II), but there was no difference between users and nonusers of services with respect to frequency of drug injection for any drug. Although not statistically significant, a slightly higher proportion of service users reported borrowing and lending needles in the past 6 months. IDUs who had been paid for sex in the past 6 months were also more likely to have used emergency or hospital services.

Hierarchical stepwise logistic regression was conducted to identify independent predictors of emergency or hospital service use (Table III). In the final

TABLE II Comparison of Drug-Using Characteristics of Injection Drug Users by Health Service Use

Variable	No (n = 586), N (%)	Yes (n = 517), N (%)	Total (N = 1,103), N (%)	*P*
Recent IDU initiate (<2 years)	108 (18)	75 (15)	183 (17)	.096
Inject cocaine	484 (83)	463 (92)	947 (87)	.001
Inject heroin	414 (70)	386 (75)	800 (73)	.058
Inject speedballs	211 (36)	246 (48)	547 (42)	<.001
Most frequently injected drug:				
Cocaine*	408 (70)	405 (80)	813 (75)	<.001
Heroin	173 (30)	104 (20)	277 (25)	
Inject >4 times/day	167 (29)	188 (37)	355 (32)	.004
Borrow in the past 6 months	217 (57)	217 (62)	434 (59)	.117
Lend in the past 6 months	207 (37)	208 (42)	415 (40)	.095
Currently in drug or alcohol treatment	123 (21)	111 (22)	234 (21)	.773
Currently in methadone treatment	59 (10)	64 (12)	123 (11)	.200
Been paid for sex in the past 6 months	125 (21)	143 (28)	268 (24)	.011

*Includes speedballs (cocaine and heroin), n = 124.

model, a number of variables were found to be associated positively with health services utilization. IDUs with unstable housing and female IDUs were significantly more likely to use emergency and hospital services. In addition, HIV-positive status, injection of cocaine, and visiting a primary care physician in the past 6 months were also found to have positive independent associations with service use. We performed a subanalysis to identify the predictors of each component of the outcome variable (emergency visits and hospitalization), and the findings were unchanged (data not shown).

DISCUSSION

This study, based on cross-sectional survey data, examined the relationships between the sociodemographic characteristics and health service utilization in a cohort of IDUs; several interesting associations were found. In terms of sociodemographic characteristics, we found an increased likelihood of emergency and hospital services use by IDUs with unstable housing and who were female.

Participants with unstable housing were more likely to have used health services; unstable housing may be a marker of the disorganized lifestyle or marginalization of some of the IDUs in our cohort. IDUs with unstable housing may not be able to keep appointments at clinics or private offices and may use the emergency department for minor symptoms because of ease of accessibility. Unstable housing also may reflect poorer health status due to lack of any consis-

tent primary care, and these IDUs may require more emergent services when they become acutely ill.

Previous studies[11,12] have found that IDUs who inject in semipublic settings such as streets, rooftops, and abandoned buildings were more likely to participate in risky needle-sharing practices and have an increased risk of HIV infection; these IDUs may be more likely to be homeless or have unstable living conditions. Studies have indicated that unstable housing, such as a hotel with single-occupancy rooms, often function as shooting galleries and may contribute similarly to high-risk behaviors that increase risk of HIV[3] and other injection-related infections.[13–15] In addition, a recent study of hospitalized homeless people found that the majority had diagnoses of substance abuse or mental illness, and most were hospitalized for otherwise preventable conditions.[16]

In our study, female IDUs were more likely to use emergency and hospital services than were male participants. In contrast, studies in the US found female IDUs and HIV-positive women to be somewhat less likely to access health services.[17,18] A recent study of health service use by urban US women with or at risk of HIV infection found that female IDUs used less primary health services and were more likely to receive episodic medical care.[19] Marginal populations in the US, such as HIV-infected women or female IDUs, may have limited access to care due to the lack of third-party insurance coverage.[20] The presence of universal health insurance in our study eliminated a major barrier to care and may explain the higher proportion of female IDUs using services in our cohort. Female IDUs also have been found to be at an increased risk for injection-related infections, such as skin abscesses and endocarditis.[21] In addition, over half of our

TABLE III Final Multivariate Logistic Regression Model Predicting Use of Health Services at Baseline Among Injection Drug Users*

Variable	Coefficient	Standard Error	Adjusted Odds Ratio	95% Confidence Interval	*P*
Unstable housing† (yes vs. no)	0.364	0.131	1.44	1.11–1.86	.005
Gender (female vs. male)	0.372	0.136	1.45	1.11–1.89	.006
HIV status (positive vs. negative)	0.355	0.151	1.43	1.06–1.92	.018
Inject cocaine or speedballs (yes vs. no)	0.408	0.149	1.50	1.12–2.02	.006
Primary care visit‡ (yes vs. no)	0.649	0.164	1.91	1.39–2.64	<.001

*Adjusting for age.

†Living in a single-occupancy hotel room, boarding room, hostel, transition house, or jail or on the street in the past six months.

‡In the past six months.

female IDUs exchanged sex for money in the prior 6 months and may have been victims of violent assaults. Thus, their increased service utilization may be, in part, a reflection of greater need for care or differences in care-seeking behavior between female and male IDUs.

Interestingly, a higher proportion of participants who used services reported a primary care visit in the previous 6 months. This group may have an increased propensity to seek care from various providers and settings. Also, certain provider attitudes or barriers may make it preferable for IDUs to use the emergency department, especially those IDUs who have particularly disorganized lifestyles and who are unable to keep scheduled appointments. Alternatively, acute medical problems may be identified readily by the primary care physician, and these patients are referred more frequently to the emergency department for care.

Not surprisingly, HIV-positive participants were more likely to use services. HIV-infected IDUs have an increased risk for a number of bacterial infections, including pneumonia and tuberculosis, and this risk has been shown to increase as the CD4 cell count declines.[22] The self-reported emergency department visits and hospitalizations, however, may not have been due entirely to HIV disease itself, as the risk behaviors for HIV are also risk factors for injection-related infections.[23] Similarly, use of cocaine and speedballs (cocaine and heroin) may have contributed to increased utilization of health services as a result of increased injection frequency relative to heroin use.

There are a number of potential limitations in our study. First, cohort participants may not be representative of all IDUs, as our study sample likely overrepresents the lowest socioeconomic strata. Second, as this is a cross-sectional analysis, we cannot infer causal relationships. We are following this cohort longitudinally to ascertain trends in health services utilization. Finally, there may be recall bias associated with self-reported data from the VIDUS survey questionnaire. Both our study and that of Solomon et al.,[18] however, have assessed the validity of self-report of health services utilization among IDUs and have found greater than 75% agreement between self-reports and administrative files, which lends support to the validity of our findings.

In summary, our results are the first to implicate unstable housing as a significant factor associated with an increased likelihood of emergency and hospital use among IDUs. Further studies are required to ascertain if strategies that improve the availability of safe and affordable housing for this population have a beneficial effect on both the health status of this group and appropriate use of health services.

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