

Transition from First Drug Use to Regular Injection among People Who Inject Drugs in Iran

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Original Article

Abstract

Background: The study aimed to evaluate the interval between first drug use and regular injection and factors associated with transition from first injection into premature regular injection among people who inject drugs (PWIDs).

Methods: In a multicenter cross-sectional study, we recruited 400 PWIDs using snowball sampling. Age of first drug use, age of initiation of regular injection, and demographic and behavioral data were collected using face to face interview. Premature transition to regular injection was defined as initiation of regular injection within the five years of first injection. Data were analyzed using bivariate and multivariate logistic regression survey analysis.

Findings: The mean age of first drug use and age of initiation of regular injection was 29.87 ± 6.54 years, respectively. Having history of sexual abuse in childhood [adjusted odds ratio (AOR) = 3.1], history of imprisonment (AOR = 3.4), use of heroin as the first drug (AOR = 4.3), and doing the first injection at friends' houses (AOR = 2.2) or in ruins (AOR = 2.2) significantly increased the chance of premature transition to regular injection, while being a female decreased the chance of premature transition to regular injection (AOR = 0.4). Compared to curiosity, being friend with a drug user (AOR = 0.4), having withdrawal symptoms (AOR = 0.2), and low cost of injection (AOR = 0.3) at the first occasion of drug injection reduced the chance of premature transition to regular injection.

Conclusion: New interventions to prevent injection initiation among drug users are needed and should be integrated in harm reduction programs.

Keywords: Intravenous substance abuse; Premature; Iran; Risk factors

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Introduction

People who inject drugs (PWIDs) are one of the key groups at higher risk of HIV/HCV infection in some parts of the world including Iran.^{1,2} It is estimated that there are 12 million PWIDs around the world.³ According to national estimates, there are currently 208000 PWIDs in Iran, about 193000 men and 16000 women.⁴ Behaviors such as needle/syringe sharing and unsafe sex are the main factors that increase the risk of HIV/HCV in this population.⁵⁻⁹ Injecting drug use is the second route of HIV transmission in the world, but the first route in Iran.¹⁰ Around 62% of HIV infected people in Iran have the history of using injecting drugs.¹¹ Low level of access to sterile syringes, lack of awareness, low perceived risk, fear of being arrested by the police because of carrying a syringe, high level of stigma, poor economic condition and support from their social network increase the risk of needle sharing and consequently human immunodeficiency virus/Hepatitis C virus (HIV/HCV) infection among PWIDs.^{6,11-13} In addition, PWIDs are at higher risk of getting tuberculosis (TB), soft tissue infections, bacteremia, botulism, cellulitis and endocarditis, overdose, fungal infections, bleeding, erythema, necrosis, thromboembolism, pain, and loss of organs compared to general population.¹⁴⁻¹⁶

One of the factors that increase the likelihood of exposure to high-risk behaviors in PWIDs is the interval between the initiation of illicit drug use and the onset of drug injection and consequently becoming a regular drug injector.^{8,17} Shorter interval is accompanied with longer duration of exposure to high risk behaviors.^{18,19} These intervals may be somehow affected by several factors including demographic characteristics, social factors (such as the history of drug injection in family members, family violence, and so on), supportive mechanisms (access to addiction treatment in the beginning of injection, access to financial resources), the conditions and personal feelings in the first experience of drug use.^{15,20,21} Therefore, identification of factors associated with premature injection can play an important role in planning harm reduction programs. Thus, the aim of this study is to find the mean interval between the onset of drug use and regular injection and factors associated with premature injection.

Methods

This cross-sectional multicenter study was conducted on 400 PWIDs who recruited from January to June 2017 in the cities of Kerman and Shiraz, Iran. A formative assessment was conducted by face to face interview with experts and key informants to identify potential sites that PWIDs live, hangout, or bargain drug in Kerman and Shiraz. Then we selected five seeds, who were people with large social network and good communication skills from different areas of each city. The study samples were recruited using snowball sampling method. Eligible participants were individuals between 18 to 45 years old who reported at least one occasion of drug injection over the past year and consented to participate in the study.

We collected the data using a questionnaire. After extensive search by search engines including Google Scholar, ScienceDirect, and PubMed the basic questionnaire was designed which contained nine sections and 100 questions. To validate the questionnaire, 15 experts including experienced epidemiologists, infectious disease specialists, psychologists, and drug use specialists reviewed each question. To check the face validity, experts were asked to investigate the questions regarding grammar, the use of proper words, the placement of items in their proper place, and the ambiguities in the questionnaire. Accordingly, two questions were deleted and other questions were revised.

The content validity was assessed using quantitative method. Content validity was assessed using item and scale content validity index (I-CVI and S-CVI) and content validity ratio (CVR). All experts reviewed the questionnaire for simplicity, relevance, and clarity using a four point Likert scale (i.e., ranging from not relevant/unclear/not simple to completely relevant/clear/simple). The I-CVI was calculated as the fraction of experts rating an item by 3 or 4. The CVR was calculated using Lawshe's approach CVR.²² The acceptable cut point for CVI and CVR were 0.78 and 0.49, respectively. Cronbach's alpha test was used to assess the internal consistency. The questionnaire was pilot tested on five PWIDs.

The final questionnaire consisted of nine sections and 98 questions. The first part consisted of 12 questions on general and demographic

characteristics; the second part consisted of 24 questions on the detailed history of drug use; the third part contained eight questions on sexual behavior; the fourth section included four questions on the family history of drug use; the fifth section included nine questions on access to care and services; the sixth section consisted of six questions on the history of imprisonment; the seventh section contained seven questions on the history of violence; the eighth section included 15 questions on the history of childhood maltreatment; and the final section consisted of 13 questions on the knowledge of HIV transmission.

All information was collected using face to face interview. Four trained interviewers (two interviewers in each city) conducted all the interviews. The length of each interview was approximately 45 minutes. Each participant was given 50000 Rials incentive for participation in the study.

Regular injection was defined as injection at least once a month for one year continuously. The time to regular injection was created by subtracting the age of first injection from the age of becoming a regular injector. If the interval was less than 5 years, it was considered as premature transition to regular injection.

Data were analyzed using Stata software (version 15). As we recruited the study sample from two different cities, interclass correlation was probable. To tackle with, we analyzed data using survey analysis. The related weights were applied based on the estimated number of PWIDs in each city.²³ Data were presented as relative frequencies and percentage for categorical as well as mean and standard deviation (SD) for continuous variables. Multivariable logistic regression was applied to determine factors associated with transition into premature regular injection adjusted for potential confounders. Variables with a P-value of less than 0.2 in univariable analysis were entered into the multivariable model. The final model was created based on the backward elimination method. The Akaike information criterion (AIC) and Bayesian information criterion (BIC) indices were calculated to select the final model. The P-value less than 0.05 was considered as significant.

The study protocol was approved by the Kerman University of Medical Sciences, Kerman, Iran, and the Ethics Committee

(IR.KMU.AH.IEC.1396.108). All questionnaires were completed anonymously in a private setting.

Results

The average age of the participants was 36.69 ± 6.07 years. The age ranged between 19 to 45 years old. The majority of participants were men (304, 76.00%), employed (207, 51.75%), and lived in the city (328, 82.00%). Most participants (159, 39.75%) were educated up to primary school, and majority of them got divorced (222, 55.50%). About 26.25% of PWIDs had no monthly income, and only 42 participants (10.50%) had income between 10 million and 20 million Rials. Most of the participants (197, 49.25%) lived lonely. Around 25% of participants lived in shelters, 27.50% were homeless, and 48% lived in their own house (Table 1).

Table 1. Demographic characteristics of People who inject drugs (PWIDs) (n = 400)

Variable	n (%)
Gender	
Female	96 (24.00)
Male	304 (76.00)
Age (year)	
18-25	14 (3.50)
25-35	148 (37.00)
35-45	238 (59.50)
Marital status	
Single	96 (24.00)
Married	82 (20.50)
Widowed/divorced	222 (55.50)
Job	
Employed	207 (51.75)
Unemployed	164 (41.00)
Illegal jobs	29 (7.25)
Income level	
No income	105 (26.25)
Less than 5000000 Rials	153 (38.25)
5000000–10000000 Rials	100 (25.00)
10000000-20000000 Rials	42 (10.50)
Place of birth	
City	328 (82.00)
Village	72 (18.00)
Place of residence	
Personal house	191 (47.75)
Shelter	99 (24.75)
Homeless	110 (27.50)
Level of education	
Reading and writing/primary	159 (39.75)
Middle school	152 (38.00)
High school/diploma	89 (22.25)
Living with	
Spouse/sex partner	64 (16.00)
Parents/relatives/friends	139 (34.75)
Lonely	197 (49.25)

The mean age of first use was 18.32 ± 4.88 years. The mean age of initiation of regular drug use was 21.38 ± 5.05 years. The mean interval between the first drug use and the first injection was 6.99 ± 4.59 years. Totally, 172 (43.00%) participants started their first injection within the five years from their first drug use, while in 228 (57.00%) participants the interval between the first drug use and first injection was more than 5 years. The most common drug used in the first experience was alcohol (54.75%) followed by opium (23.75%). The most common drug used in first injection was heroin (Table 2).

Factor associated with transition from first injection to regular injection: The mean age of first injection and the onset of regular injection was 25.32 ± 5.18 and 29.87 ± 6.54 years, respectively (Table 2). The mean interval between the onset of the first injection and initiation of regular injection was 4.52 ± 3.24 years. Approximately, 38% of PWIDs started regular injection in less than 5 years from their first injection (premature regular injection) (Table 2).

The results of multivariate analysis showed that being a female significantly decreased the chance of premature transition to regular injection [adjusted odds ratio (AOR) = 0.4, 95% confidence interval (CI): 0.2-0.8]. Compared to curiosity, being friend with a drug user (AOR = 0.4, 95% CI: 0.2-0.9), having withdrawal symptoms (AOR = 0.2, 95% CI: 0.1-0.5), and low cost of injection (AOR = 0.3, 95% CI: 0.1-0.7) at the first occasion of drug injection reduced the chance of premature transition to regular injection. In contrast, having history of sexual abuse in childhood (AOR = 3.1, 95% CI: 1.4-6.7) and history of imprisonment (AOR = 3.4, 95% CI: 1.3-8.6) increased the chance of premature transition to regular injection. Furthermore, use of heroin (compared to opium) as the first drug (AOR = 4.2, 95% CI: 1.7-10.7) and doing the first injection at friends' houses (AOR = 2.2, 95% CI: 1.1-4.6) or in ruins (AOR = 2.2, 95% CI: 1.0-4.8) significantly increased the chance of premature transition to regular injection compared to their own house (Table 3).

Table 2. Drug use behavior among people who inject drugs (PWIDs) (n = 400)

Types of behavior (mean \pm SD)	Value
Age of first drug use	18.32 \pm 4.89
Age of initiation of regular drug use	21.38 \pm 5.06
Age of first injection	25.32 \pm 5.19
Age of initiation of regular injection	29.87 \pm 6.54
Interval between first drug use and regular use	3.08 \pm 3.39
Interval between first drug use and first injection	6.99 \pm 4.59
Interval between first injection and regular injection	4.52 \pm 3.24
Types of behavior [n (%)]	
The types of first drug used	
Alcohol	219 (54.75)
Cigarette	150 (37.50)
Opium	95 (23.75)
Cannabis	77 (19.25)
The types of first drug injected [n (%)]	
Heroin	314 (95.73)
Opium	6 (1.84)
Methamphetamine	12 (3.70)
Current drug use [n (%)]	
Heroin	381 (95.49)
Methamphetamine	349 (87.47)
Cigarette	150 (37.50)
Methadone	136 (34.09)
Cannabis	77 (19.30)
Opium	69 (17.29)

SD: Standard deviation

Table 3. Factors associated with transition from first injection to premature regular injection among people who inject drugs (PWIDs)

Variable	Premature transition (n = 151) [n (%)]	Non-premature transition (n = 249) [n (%)]	Crude OR (95% CI)	P	Adjusted OR (95% CI)	P
Gender				< 0.001	0.4 (0.2-0.8)	0.010
Female	57 (14.20)	39 (9.70)	0.1 (0.1-0.4)			
Male	94 (23.50)	210 (52.50)	1		1	
Reason of first injection						
Curiosity	23 (5.75)	19 (4.70)	1		1	
Friendship with a drug user	31 (7.75)	60 (15.00)	0.4 (0.2-0.9)	0.031	0.4 (0.2-0.9)	0.030
Inevitably	23 (5.75)	30 (7.50)	0.6 (0.2-1.3)	0.213	0.4 (0.2-1.1)	0.060
Having withdrawal symptoms	51 (12.75)	79 (19.70)	0.5 (0.2-1.0)	0.055	0.2 (0.1-0.5)	0.000
Lower cost of injection	23 (5.75)	61 (15.20)	0.3 (0.1-0.6)	0.003	0.3 (0.1-0.7)	0.010
Childhood physical neglect						
None or minimal	61 (15.25)	190 (47.50)	0.7 (0.4-1.2)	0.256	0.7 (0.3-1.4)	0.310
Low to moderate	38 (9.50)	26 (6.50)	1	-	1	-
Moderate to severe	12 (3.00)	29 (7.25)	0.9 (0.4-2.0)	0.804	0.6 (0.3-1.3)	0.250
Severe to extreme	40 (10.00)	4 (1.00)	1.4 (0.8-2.6)	0.234	0.5 (0.2-1.3)	0.140
Childhood sexual abuse						
None or minimal	83 (20.70)	190 (47.50)	1	-	1	-
Low to moderate	40 (10.00)	26 (6.50)	3.4 (1.9-6.0)	< 0.001	3.1 (1.4-6.7)	0.000
Moderate to severe	21 (5.20)	29 (7.20)	1.6 (0.9-3.1)	0.110	1.3 (0.6-2.9)	0.450
Severe to extreme	7 (1.70)	4 (1.00)	4.1 (1.2-14.6)	0.020	3.2 (0.8-13.4)	0.100
Age of first drug use						
≤ 15 years	30 (7.50)	79 (19.70)	1	-	1	-
> 15 years	121 (30.20)	170 (42.50)	2.3 (1.4-3.8)	0.001	1.7 (0.9-3.0)	0.080
Reason of first drug use						
Curiosity	23 (5.90)	66 (17.10)	1	-	1	-
Friendship with addicted person	41 (10.60)	84 (21.80)	1.2 (0.6-2.3)	0.530	1.1 (0.5-2.3)	0.720
More joy	30 (7.80)	33 (8.70)	2.5 (1.2-5.2)	0.012	2.0 (0.9-4.7)	0.090
To forget the problems	41 (10.60)	41 (10.60)	2.8 (1.4-5.5)	0.002	1.4 (0.6-3.5)	0.450
Other reasons	11 (2.90)	15 (3.90)	2.1 (0.8-5.5)	0.114	1.2 (0.4-3.9)	0.770
Place of first injection						
Own house	33 (8.20)	59 (14.70)	1	-	1	-
Friend's house	54 (13.50)	72 (18.00)	1.3 (0.7-0.3)	0.163	2.2 (1.1-4.6)	0.020
Ruin	46 (11.50)	79 (19.70)	1.0 (0.6-1.9)	0.290	2.2 (1.0-4.8)	0.030
Prison	4 (1.00)	12 (3.00)	0.6 (0.2-2.0)	0.445	1.7 (0.3-7.8)	0.480
Park/Street	14 (3.50)	27 (6.70)	0.8 (0.3-1.7)	0.693	1.7 (0.7-4.3)	0.220
Types of first drug used						
Opium	28 (7.00)	52 (13.00)	1	-	1	-
Alcohol	82 (20.50)	137 (34.20)	1.1 (0.5-1.5)	0.620	1.0 (0.5-1.9)	0.960
Heroin	15 (3.70)	14 (3.50)	2.6 (1.0-5.2)	0.040	4.2 (1.7-10.7)	0.000
Cannabis	9 (2.20)	22 (5.50)	0.5 (0.2-1.1)	0.100	0.6 (0.2-1.6)	0.310
Others drugs	17 (4.20)	24 (6.00)	1.5 (0.6-2.6)	0.490	2.2 (0.9-5.5)	0.070
History of arrest/imprisonment						
No	28 (7.00)	20 (5.00)	-	1	-	-
Yes	123 (30.70)	229 (57.20)	0.34 (1.2-2.9)	< 0.001	3.4 (1.3-8.6)	0.010
Sex relationship						
Yes	138 (34.50)	236 (59.00)	1.8 (0.8-4.2)	0.160	3.4 (1.3-8.5)	< 0.001
No	13 (3.20)	13 (3.25)	-	-	-	-

OR: Odds ratio; CI: Confidence interval

Discussion

The results of present study indicate that overall, PWIDs start injection within the seven years from their first drug use, and it takes about four years from their first injection to be a regular drug injector. The mean age of the first drug experience

is about 18 years old, while the mean age of using injecting drug is higher (around 25 years for first injection and 30 years for regular injection). Early transition from first occasion of injection to regular injection was associated with gender, reason, and place of first injection, childhood history of sexual abuse, imprisonment, and types

of first drug that has been used.

The result of a systematic review in Iran showed that PWIDs had been using drugs from 4 to 15 years before their first experience of drug injection with the average time of 6 to 7 years and the mean age of 26 years at first injection, which is in line with our results. It seems that PWIDs in Iran experience their first drug injection at older ages³ compared to other countries in which the age of first injection is 19 to 22 years.^{7,16,24-26} Furthermore, the time lag from the first drug use and first injection is relatively high in Iran compared to other countries,²⁷⁻³⁰ and should be regarded as critical time to mobilize prevention efforts and interventions. The most common type of drug at first injection was heroin. Although none of previous studies in Iran reported the initiation of drug injection by stimulants,³ around 4% of our study participants reported the methamphetamine as the first injecting drug that they used. So, it seems that the pattern of drug injection has been changed. Heroin is the most prevalent drug of injection in Middle East and North Africa (MENA) region,³¹ while in other regions, other types of drugs such as cocaine, methamphetamines, and marijuana are more prevalent.³² This may be partly related to differences in availability of various types of drugs in different regions. For example, in countries such as Iran and most of MENA countries in which non-injecting heroin is more prevalent, it is more likely to be the most frequent injecting drug compared to countries like Canada and the United States of America (USA) in which other types of drugs such as cocaine, methamphetamines, and marijuana are more prevalent.^{32,33}

Regarding the first type of drug that was used, heroin compared to opium increased the chance of transition into premature regular injection. Other studies confirmed that the risk of transition to injection among heroin users are higher compared to other types of drugs.³⁴ The risk of early transition to regular injection also has been reported to be high among people who used heroin as the first injecting drug compared to other types of drugs.³⁵ It has been suggested that heroin, specially injecting type, has higher degree of dependency compared to other drugs.³⁶

Among the motivators of first injection, having withdrawal symptom, being friend with a drug user, and lower cost of injection compared to other routes of consumption in comparison with curiosity has been associated with decreased likelihood of

early regular injection. Although the role of peer drug user, lower cost of injecting drugs, and reaching to higher level of rush transition to drug injection have been established in variety of studies,³⁷ it seems that someone's curiosity compared to mentioned factors is more important in premature transition to regular injection.^{38,39}

The history of childhood sexual abuse in our study was significantly related to initiation of early regular injection. The relationship between childhood sexual abuse and early initiation of drug injection has been established in various studies.^{40,41} Long-term notorious effects of sexual abuse such as mental disorders (including depression and anxiety) may predispose affected individuals to start injection earlier than those without the history of sexual abuse.⁴² Therefore, proper education of families and parents, providing a safer living environment to prevent childhood sexual abuse, and screening and treatment of sexually abused children to reduce adverse mental sequences may be beneficial in prevention of early regular injection.

In our study, the history of imprisonment has been associated with early regular injection. Studies on illicit drug users indicated that having history of incarceration was an important risk factor for initiation of injection in this people. Factors such as low level of access to drugs, high price, and difficulty in use of smoking drugs at prisons were the main causes of injection initiation among incarcerated drug users.^{43,44} Place of first injection was also an important factor that significantly was related to early regular injection. Injection in a friend's house or ruined buildings compared to one's own house increased the likelihood of early regular injection.

Our findings are subject to several limitations: The cross-sectional nature of data allowed us associations to be analyzed but not causal inference. The results of present study could not be generalized to all PWIDs. Moreover, a random sample was not drawn, mainly due to lack of access to the sampling frame. Finally, social desirability bias in response to sensitive questions may affect the validity of data.

Conclusion

Non-injecting drug users (NIDUs) are at the risk of switching into injecting drug use. Transition into use of injecting drugs and especially

premature transition may put them at higher risk of HIV/HCV infection. Therefore, understanding factors related to injection initiation may be beneficial in design and implementation of more targeted programs. New interventions to prevent switching into drug injection among NIDUs are urgently needed and should be designed and evaluated in future researches.

Conflict of Interests

The Authors have no conflict of interest.

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تغییر الگوی مصرف از اولین تجربه مصرف مواد تا تزریق منظم در بین مصرف‌کنندگان تزریقی مواد در ایران

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مقاله پژوهشی

چکیده

مقدمه: هدف از انجام مطالعه حاضر، بررسی فاصله زمانی بین اولین تجربه مصرف مواد تا زمان روی آوردن به تزریق منظم و تعیین عوامل مرتبط با تزریق منظم زودرس در بین مصرف‌کنندگان تزریقی مواد بود.

روش‌ها: در این پژوهش چند مرکزی، ۴۰۰ مصرف‌کننده تزریقی مواد با استفاده از روش نمونه‌گیری گلوله برفی از شهرهای کرمان و شیراز وارد تحقیق شدند. سن اولین تجربه مصرف مواد، سن شروع تزریق منظم مواد و اطلاعات دموگرافیک و رفتاری با استفاده از مصاحبه رو در رو جمع‌آوری گردید. تزریق زودرس به صورت شروع تزریق منظم مواد به فاصله کمتر از ۵ سال از اولین تجربه تزریق تعریف شد. داده‌ها با استفاده از آزمون رگرسیون لجستیک تک متغیره و چند متغیره و با استفاده از دستور آنالیز Survey مورد تجزیه و تحلیل قرار گرفت.

یافته‌ها: میانگین سنی اولین تجربه مصرف مواد، $4/88 \pm 18/32$ سال و میانگین سنی شروع تزریق منظم، $6/54 \pm 29/87$ سال بود. دارا بودن سابقه سوء استفاده جنسی در دوران کودکی (نسبت شانس اصلاح شده: ۳/۱)، سابقه زندانی شدن (نسبت شانس اصلاح شده: ۳/۴)، نوع ماده در اولین تجربه مصرف مواد (نسبت شانس اصلاح شده: ۴/۳)، انجام اولین تزریق در خانه دوستان (نسبت شانس اصلاح شده: ۲/۲) و یا در خرابه‌ها (نسبت شانس اصلاح شده: ۲/۲) به طور معنی‌داری شانس تزریق زودرس را افزایش داد؛ در حالی که زن بودن (نسبت شانس اصلاح شده: ۰/۴)، منجر به کاهش شانس تزریق زودرس شد. علاوه بر این، در بین دلایل شروع تزریق، دوست بودن با یک مصرف‌کننده مواد (نسبت شانس اصلاح شده: ۰/۴)، داشتن علایم ترک (نسبت شانس اصلاح شده: ۰/۲) و کم‌هزینه بودن تزریق (نسبت شانس اصلاح شده: ۰/۳) در مقایسه با تزریق از روی کنجکاو، به طور معنی‌داری منجر به کاهش شانس تزریق زودرس گردید.

نتیجه‌گیری: فاصله زمانی ده ساله بین شروع مصرف مواد و شروع تزریق منظم، مطرح‌کننده زمان طلایی برای هدف‌گیری مداخلات پیشگیرانه از تزریق مواد می‌باشد. با شناسایی عوامل مرتبط با تزریق زودرس و تعریف گروه‌های آسیب‌پذیر و طراحی و اجرای مداخلات همه جانبه، می‌توان از شروع تزریق در مصرف‌کنندگان مواد جلوگیری کرد و یا آن را به تأخیر انداخت.

واژگان کلیدی: مصرف‌کنندگان تزریقی مواد، زودرس، ایران، عوامل خطر

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