What are Differences between Non-injecting and Injecting Drug Addicts?

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ABSTRACT

Background: This study aims to identify the differences between Injecting Drug Users (IDUs) and non-IDUs, with regard to some potential factors. This could be useful to design effective interventions for harm reduction, which is one of the priority areas in reducing the burden of addiction.

Methods: Sixty cases and 60 controls participated in this pair-matched case-control study, which was conducted in Tehran. The cases were IDUs who were asked to introduce two friends; one IDU and the other non-IDU as the paired control. In addition to demographic variables, onset age of cigarette smoking, dropping out of school, imprisonment, history of being sexually abused for money, and family history of using illegal drugs were obtained from the cases and controls via an interview. Pair Odds Ratio (OR) was estimated through McNemar and conditional multivariable logistic regression analysis.

Results: Eighty-three % of the IDUs and 92% the controls were male. The mean for onset age of cigarette smoking was 16 in the cases and 20 in the controls, which was significantly different between cases and controls (P<0.001).

In the multivariate analysis, dropping out from school was significantly different between cases and controls (OR=4.22 95% CI: 2.23 – 14.0). Imprisonment was more frequent in IDUs compared to non-IDUs (OR=3.70 95% CI: 1.09 – 11.08). The cases had more sexual relationship for earning money compared to the controls (OR=3.14 95% CI: 1.24 – 13.70). Onset age of cigarette smoking was significantly (P<0.001) sooner in the IDUs compared to the non-IDUs (15.9 and 20.1 years, respectively). IDUs reported 5.5 times more that non-IDUs of having an addict in their family (P value=0.04).

Conclusion: The finding of this study can be useful in identifying the persons who are at risk of IDU. Therefore, people who involve with risk factors recognized in this study should be triggered for harm reduction prevention strategies.

Keywords: Addiction, case control, injection drug use, snowball sampling

INTRODUCTION

Iran is highly affected by addiction. A study on the data from 1978 to 1998 showed that Iran had experienced an 8% increase in the incidence of drug abuse annually. It means that the population of drug users is doubling every 12 years.[1] Iran has the highest proportion of opium and heroin addicts in the world.[2] The subsequent figure is an estimate of 200 to 300 thousand Injecting Drug Users (IDUs) in the country.[3] Because of sharing needles and also high-risk sex behaviors, the IDUs are at risk of of contracting hepatitis B virus (HBV), HCV, and HIV.[4-6] A study on IDUs admitted in the drop-in centers in Iran revealed that 20.5% of them were infected with HIV and 43.4% with HCV.[7] On the other hand, drug injection was responsible for more than 60% of the reported HIV cases in Iran in 2003.[8,9] This is the reason why preventing transition from non-injecting to injecting drug use is an essential strategy in reducing harm of drug abuse, which is a part of Iran's drug policy.[10]

There are few studies conducted worldwide on factors affecting the transition of non-injection addiction to IDU. Although the studies in the other parts of the world are quantitative,[11,12] to the best of our knowledge, just a landmark qualitative study was published from Iran about this issue.[3] In the later study, 81 key informants and 154 IDUs in six districts of Tehran participated in the in-depth interviews. The results showed that the IDUs were really at high risk of harm, as 30 – 100% of them, in different districts, shared their syringes. Several factors were posed to affect the tendency to injection, including ease of access, being more pleasant, poverty, increasing cost of drugs, impurity of substances, unavailability of other methods in prison, and peer pressure. In this study Razzaghi *et al*. introduced these factors and gave a holistic view about subsequent policy implications.[3]

The present study aims to identify some of the factors, and their magnitude, which may explain the differences between IDUs and non-injecting drug users. This could be a basis for designing the possible interventions to prevent transition from a non-injection to an injection phase in harm-reduction programs.

METHODS

This study was conducted through a case control design with pair matching. One hundred and twenty pair-matched study subjects, that is, 60 in each group, were recruited in the fifth district of the Tehran municipality divisions. The cases were IDUs during last year, who injected at least once a week regularly, at the time of study. Observation of the needle scars was a necessary criterion for enrollment of the cases. Following completing of the data from each case, he/she was asked to introduce two friends; one IDU and the other non-IDU, with the age close to his/hers. The two friends of an IDU were a pair, case and control. Figure 1 shows the scheme of the study. Ten cases were the initial seeds that were selected based on convenience sampling and the study's arms started from them. Therefore, the sampling method was of snowball sampling. The control was defined as a person who was an addict for at least one year. The selection criteria were stating that he/she had never injected drugs during their lifetime and the needle scar in the arms and feet was not observed. If a case failed to introduce two subsequent friends, the sampling stopped in this arm and continued with the other seeds till the sample size was completed.

A questionnaire was used for observation and interview. The data collected with this questionnaire were demographic and some social variables. The demographic variables were age, sex, source of earning money, and literacy level. The other variables were onset age of cigarette smoking, dropping out of school, imprisonment, history of sexual relationship for money, and family history of using illegal drugs. Cases and controls were asked about exposure to these factors and proceeding to contracting addiction. The reliability of the questionnaire — containing 35 questions — was assessed by a test–retest on 15 study subjects, before the study, with a two-week interval. All the

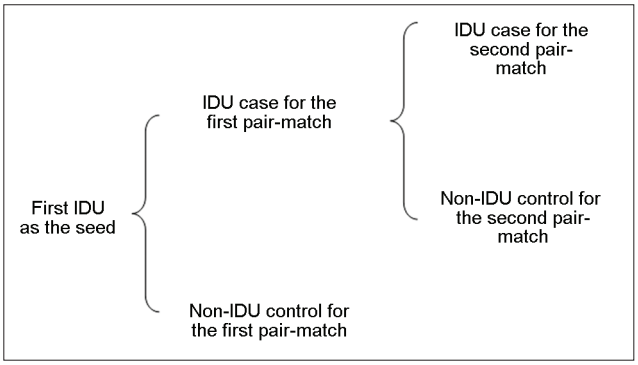

Figure 1: Snowball sampling for the cases and control of the study on IDUs and non-IDUs in Tehran

questions had an Intraclass Correlation Coefficient (ICC) of more than 0.7 and the median of the questions' ICC was 0.87.

The interviewers were selected from among several volunteers and they got training on how to conduct an interview, as a part of the quality assurance of the study. The other measures were defining a precise protocol for the study and conducting the interview in a peaceful environment.

Gifts were given to study subjects in order to participate in the study and encourage their friends to do so, as well. The gifts were coupons for purchasing any product from a drug store nearby the place of the study.

Each case and its pair control introduced by the same case, including the initial seeds, were considered as related pairs. The test of significance and pair Odds Ratio (OR) were estimated through a paired *t* test and McNemmar test, as the crude analysis. Those variables that had a *P* value less than 0.2 in the crude analysis were entered in multivariable conditional logistic regression analysis. The final variables in the model were selected by the backward approach.

The study was reviewed and approved by the research affairs of the Tehran University of Medical Sciences. Part of this process was an ethical review based on the National Ethics Guidelines.

RESULTS

Eighty three percent of the IDUs and 92% the controls were male. Table 1 compares the basic characteristics of the study groups. There is no significant difference in the age of the two groups (*P*=0.70). Regardless of the case or control status the median of age was 22 years with a minimum and maximum of 15 to 49 years, which showed a skewed distribution of the age. Case and control groups were also similar regarding sex (*P*=0.67).

Table 1: Comparison of intravenous drug users (IDUs) versus non-IDUs according to basic characteristics, in Tehran

	IDUs	Non-IDUs	*P* value[†]
	Mean±SD	Mean±SD	
Age (year)	28.3 ± 4.0	28.1 ± 3.9	0.70
Education (year)	8.4 ± 4.0	11.2 ± 3.0	0.001
Onset age of cigarette smoking (year)	15.9 ± 1.9	20.1 ± 2.3	<0.001
Onset age of drug abuse (year)	18.2 ± 1.8	21.8 ± 1.8	<0.001

[†]Based on *t*-pair test

The source of earning money was obtained as a proxy for the economic status of the participants. Just one-third of the study subjects earned money from legal sources in both the case and control series. Around half of the IDUs earned money from drug smuggling. This figure was 35% in the controls, which was not significantly different from the cases (*P*=0.31).

Table 2 shows that 63% of the cases and 37% of the controls stated that they had dropped out from the school. Both crude and adjusted results showed that this factor statistically differed between the cases and controls. The 'educational years' variable was dropped from this model due to co-linearity with the 'dropping out from the school' variable. The imprisonment was three times more frequent in the IDUs compared to the non-IDUs. On the other hand, more than half and near to one-third of the cases and controls had sexual relationship for earning money, before involving in drugs, respectively. The family history of consumption of illegal drugs increased the contraction of IDU. This was significantly significant in the crude analysis. In the adjusted analysis, while the *P* value for the later variable was not significant in the Z-test, the result of the Likelihood ratio test was significant and did not allow dropping of the variable from the final model.

DISCUSSION

Harm reduction is one of the essential strategies in dealing with the burden of drug addiction. Knowledge about factors that can affect intravenous drug injection is important for the development of harm reduction programs. This study was conducted to determine the magnitude of factors affecting the IDU in comparison to addicts who do not use drugs by injection. The onset age of cigarette smoking, dropping out from school, imprisonment, and being sexually assaulted for earning money were statistically different between study groups.

The skewed age distribution showed that the study subjects were mostly youth, and also how the addiction both by means of injection and non-injection was rapidly growing in this

Table 2: Result of matched crude and adjusted analysis of an independent variable on being an Intravenous Drug User (IDU) versus a non-IDU, in Tehran

	Case *n* (%)	Controls *n* (%)	Crude OR† 95% CI††	Adjusted OR‡ 95% CI	*P* value
Dropping out of school					
No	16 (32.0)	34 (68.3)	1	1	0.009
Yes	44 (62.9)	26 (37.1)	3.50 (1.51 – 8.1)	4.22 (2.23 – 14.0)	
Onset age of cigarette smoking					
Under 18	32 (53.3)	14 (23.4)	1	1	-
18 – 25	20 (33.3)	29 (48.3)	0.37 (0.16 – 0.87)	0.06 (0.01 – 0.90)	0.04
Above 25	8 (13.4)	17 (28.3)	0.25 (0.08 – 0.70)	0.04 (0.01 – 0.62)	0.02
Imprisonment					
No	21 (45.0)	38 (63.3)	1	1	0.04
Yes	39 (55.0)	22 (36.7)	3.12 (1.40 – 6.92)	3.70 (1.09 – 11.08)	
Having sexual relation for earning money					
No	29 (48.3)	41 (68.3)	1	1	0.03
Yes	31 (51.7)	19 (31.7)	2.80 (1.20 – 6.70)	3.14 (1.24 – 13.70)	
Consumption of illegal drugs in the family					
No	13 (21.7)	47 (78.3)	1	1	0.06‡‡
Yes	47 (78.3)	13 (21.7)	6.13 (2.13 – 17.62)	5.48 (0.89 – 33.4)	

†Crude OR (Odds Ratio): These are the results of matched analysis; ††CI: Confidence interval; ‡Adjusted Odds Ratio by conditional logistic regression; ‡‡The result of likelihood ratio test was Chi-2 4.11 with a *P* value=0.04. Therefore, this variable was not dropped out from the model and showed statistically significant association

population. The other important finding was the method of earning money, which half of the IDUs and one-third of the non-IDUs got from selling illegal drugs.

Findings of the control group of this study cannot be generalized to the non-IDU population, as the control study subjects were selected based on the friendship with IDUs. This could account to being one of the limitations of snowball case–control sampling. On the other hand, this kind of sampling is suitable for hidden populations. The over-matching due to snowball sampling and also enrollment of control friends is explained in the literature. Although the similarity between case and controls on confounding variables is an advantage, the estimated associations of such studies might be under-estimated.[13]

We collected the exposure data regarding the time before dealing with addiction. Therefore, these are factors in IDUs compared to non-IDUs, although we cannot consider them as determined factors affecting transition from non-IDU to IDU. In other words, these are mostly distal factors in comparison to proximal factors that might occur just before transition from one phase to the other. The other consideration for interpretation of the study is the comprehensiveness of the measured variables. However, it is possible to suggest other variables in addition to what we have considered in our objectives. As the study subjects, IDU as well as non-IDU addicts, were from among the hard-to-reach populations, interviews with the study subjects were very difficult. We had limited time to conduct the interviews. Therefore, we selected the most important variables to be included in the study. Of course, the study could be expanded to other sets of variables as well.

We did not find a difference between genders of the study groups. However, it is estimated that just four to nine thousand females are IDU in the country[14] and they are much fewer than the male IDUs.[15] We can consider this a non-significant finding on sex by snowball sampling, which somehow brought cases and controls that were similar to each other.

Although there was no significant difference between case and controls, around half of the IDUs and more than one-third of the non-IDUs earned money from drug smuggling. A study conducted in Pakistan comparing the IDU with the non-IDUs showed that the income generation via illegal modes was associated with the use of drugs through injections.[16]

This study showed that the onset age for cigarette smoking and drug abuse are important predisposing factors for IDU. These findings are in agreement with the Vanameijden *et al*.[11] study and confirm Razzaghi *et al*.*'s*[3] qualitative study. It emphasizes on the importance of the onset age of starting tobacco and drug consumption in adolescents, and how interventions on this issue are crucial in harm reduction. A nation-wide study in Iran shows that the onset age of cigarette smoking is almost 13.2 years.[17] The onset ages of cigarette smoking were 11.4 and 13 years in two widely different socioeconomic areas of Tehran.[18] The later study proposed family level interventions for dealing with early onset of cigarette smoking in adolescents.

'Dropping out from school' is one of the social disruption variables that has been studied. It is a proxy indicator for risky behaviors (such as cigarette smoking, drug smuggling, and serious fights) in school ages, and shows a predisposing personality of the involved person to risky behaviors such as injecting drugs.[19] Two studies conducted in Canada and United States, showed that one of the factors associated with IDU was low education.[20,21]

Imprisonment is one of the significant factors in this study. This is in agreement with the qualitative study of Razaghi *et al*. in Tehran.[3] The prison environment and ease of access to injection in comparison to other methods of using drugs such as inhalation is one of the predisposing factors in contracting IDU.

In accordance with our study finding, the history of genital Herpes was also more frequent in injecting drug users in comparison to non-IDUs.[16]

Some reservations should be considered for the interpretation of the present study, for application. The significant factors might not have a direct influence and they might predispose the person for confronting with other factors that cause IDU. Therefore, although designing primary prevention based on these factors might be questionable, they could be very useful to trigger the susceptible cases and beneficial in designing secondary preventions by targeting cases for supportive interventions.[22]

In this study, the onset age of cigarette smoking, history of imprisonment, having sexual relationship for earning money, dropping out from school, and presence of an addict in the family were recognized as important risk factors for IDU. Two approaches could be considered in designing the interventional plans. The first is the general primary prevention by protection of adolescents from starting cigarette and drug consumption. Then a prompt recognition of risky cases by triggering adolescents in families who have addict members or youths confronted with any form of social disruptions, such as, dropping from school, having sexual relationship for earning money or history of imprisonment.

The findings of this study have potential implications for policy makers in the area of adolescent health and harm reduction.

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REFERENCES

1. Movaghar AR, Mohammad K, Razaghi EM, Trends in Drug Abuse in Iran: A Three-Decade Survey. Hakim Res J 2002;6:171-81.
2. United Nations Office on Drugs and Crime. World Drug Report. United Nations Office on Drugs and Crime, Vienna. 2005.
3. Razzaghi EM, Movaghar AR, Green TC, Khoshnood K. Profiles of risk: A qualitative study of injecting drug users in Tehran, Iran. Harm Reduct J 2006;3:12.
4. Haverkos HW, Infectious diseases and drug abuse. Prevention and treatment in the drug abuse treatment system. J Subst Abuse Treat 1991;8:269-75.
5. Zamani S, Kihara M, Gouya MM, Vazirian M, Nassirimanesh B, Ono-Kihara M, *et al*. High prevalence of HIV infection associated with incarceration among community-based injecting drug users in Tehran, Iran. J Acquir Immune Defec Syndr 2006;42:342-6.
6. Karimi A, A Seroprevalence of HBV, HCV and HIV among intravenous drug users in Iran. J Clin Virol 2006;36:210-1.
7. Mirahmadizadeh AR, Majdzadeh R, Mohammad K, Forouzanfar MH. Prevalence of HIV and Hepatitis C Virus Infections and Related Behavioral Determinants among Injecting Drug Users of Drop-in Centers in Iran. Iran Red Crescent Med J 2009;11:325-9.
8. Iranian Ministry of Health and Medical Education:

Statistics on HIV/AIDS in Iran. 2003.
9. Salazar C, Setayesh H. Uniting the World against AIDS. Iran (Islamic Republic of) UNAIDS: Joint United Nations Programme on HIV/AIDS, 2006.
10. Vick K. AIDS Crisis Brings Radical Change In Iran's Response to Heroin Use. Available from: [http://www.washingtonpost.com/wp-dyn/content/article/2005/07/04/AR2005070401182.html]. [Last accessed on 2009 July 5].
11. Vanameijden EJ, Vandenhoek JA, Hartgers C, Coutinho RA. Risk-Factors for the Transition from Noninjection to Injection-Drug Use and Accompanying Aids Risk Behavior in A Cohort of Drug-Users. Am J Epidemiol 1994;139:1153-63.
12. Sanchez J, Chitwood DD, Koo DJ. Risk factors associated with the transition from heroin sniffing to heroin injection: A street addict role perspective. J Urban Health Bull 2006;83:896-910.
13. Rothman KJ, Greenland S, Lash TL. Modern Epidemiology. Philadelphia: Lippincott Williams and Wilkins; 2008.
14. Movaghar AR. Prevalence and pattern of females' drug consumption and addiction in Iran. Socl Welf Quart 2004;3:203-26.
15. Razzaghi EM, Movaghar AR, Mohammd K. Rapid assessment of drug abuse in Iran. State Welfare Organization of Iran and United Nations Office on Drugs and Crime. 2000.
16. Agha A, Parviz S, Younus M, Fatmi Z. Socio-economic and demographic factors associated with injecting drug use among drug users in Karachi, Pakistan. J Pak Med Assoc 2006; 56 (1 Suppl 1): S55-60.
17. Kelishadi R, Ardalan G, Gheiratmand R, Majdzadeh R, Delavari A, Heshmat R, *et al*. Smoking behavior and its influencing factors in a national-representative sample of Iranian adolescents: CASPIAN study. Prev Med 2006; 42:423-6.
18. Rezaei F, Nedjat S, Golestan B, Majdzadeh R. Comparison of onset age and pattern of male adolescents smoking in two different socioeconomic districts of Tehran. Int J Prev Med 2011;2:224-8.
19. Roy E, Haley N, Leclerc L, Cedras P, Blais L, Boivin JF. Drug injection among street youths in Montreal: Predictors of initiation, J Urban Health 2003; 80: 92-105.
20. Hammond GW, Tate R, Buchanan D, Malazdrewicz R, Chochinov D, Sekla L, *et al*. Seroprevalence and demographic characteristics of injection drugs users among individuals at risk for HIV infection in Winnipeg, Manitoba, Canada. Clin Invest Med 1991;14:437-43.
21. Swendsen J, Conway KP, Degenhardt L, Dierker L, Glantz M, Jin R, *et al*. Socio-demographic risk factors for alcohol and drug dependence: The 10-year follow-up of the national co-morbidity survey. Addiction 2009;104:1346-55.
22. Szklo M, Nieto FJ. Epidemiology: Beyond the Basics. 2nd ed, Sudbury, USA: Jones and Bartlett Publishers; 2006.

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