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HIV Susceptibility and Risk Behaviors amongst Female Heroin Offenders in Taiwan

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A growing body of evidence in earlier studies indicated that injecting drug users (IDUs) experience greater difficulties in making changes when reducing their sexual risk behaviors than to reduce their drug-related risk practices. The purpose of this study is to investigate the correlation between HIV susceptibility and sexual risk behaviors, and injection risk practices among female IDUs in Taiwan. Two hundred and fifty four female IDUs agreed to participate in this study, and signed consent forms between June and August 2007. The questionnaire contained background information, drug-use history, injection-related risk practices, sex-related risk behaviors, HIV susceptibility, and measures of knowledge about HIV/AIDS transmission. About 48 % of the women reported having IDU sexual partners, and only 17% had used a condom during the last sexual encounter. Regarding injection-related practices, 72% did not share needles, and 58% did not share rinse water with others in the past year. Results from multiple regression analysis revealed that having IDU sexual partners and not using condom during the last sexual encounter were not statistically significant with HIV susceptibility ($\beta=0.09$, $p>0.05$; $\beta=0.02$, $p>0.05$, respectively). Age, and sharing needle and rinse water in past year were significantly associated with HIV susceptibility ($\beta= 0.19$, $p< 0.01$; $\beta= 0.17$, $p< 0.05$; $\beta= 0.20$, $p< 0.05$, respectively). The findings provide evidence that injection-related risk practices obviously could raise HIV susceptibility of female IDUs, but sex-related risk behaviors did not. This implies that HIV and sexuality education should be provided to female injection drug users as soon as possible.

Key Words: Female injection drug users, HIV, Injection-related risk practices, Sex-related risk behaviors, Susceptibility,

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Introduction

Between the years of 2004 to 2007, 5,610 Human Immunodeficiency Virus (HIV) infections associated with injection drug use (IDU) accounts for 57.4% of the 9,766 newly found HIV cases (Taiwan Center for Disease Control, 2008). In response to this HIV endemic, there has been extensive public health focuses on reducing injection-related risks within the IDU populations in Taiwan. Harm reduction programs consisted of methadone substitution treatment in hospitals, HIV/AIDS education for high risk groups and provision of clean needles and saline water through pharmacy stores were quickly initiated (Lu & Lee, 2008) and expanded throughout the island by the Department of Health in July 2006 and since then the number of IDUs infected with HIV has decreased (Taiwan Center for Disease Control, 2008).

It is evident that some success of harm reduction programs has been observed in reducing incidence of injection-related HIV infection among Taiwan IDUs (Taiwan Center for Disease Control, 2008), but unprotected sex behaviors of IDUs have remained a great challenge in the long-term period (Lu & Lee, 2008). For example, a follow-up study (Strathdee et al., 2001) collected data from 1,800 IDUs in Baltimore every six months from 1988 to 1998, and it was found that the most significant predictor of HIV infection for both male and female IDUs was the high-risk

sexual behavior. This study also found that sharing needles increased the risk of HIV infection among women IDUs. However, high-risk heterosexual activity was a much more important risk factor for these women.

HIV susceptibility, exchange for drugs and self-efficacy for sex risk reduction have been found to be associated with condom use among IDUs (Gossop, Marsden, Stewart, & Treacy, 2002; Lee, 2006). Some studies have reported that women's partners tend to overlap between members of their drug abuse and sexual networks compared to men, making female drug users especially vulnerable to acquiring HIV through unprotected sex (Lu & Lee, 2008; Miller & Neaigus, 2002). Because heterosexual transmission of HIV infection is more efficient from men to women, having unprotected sex is of greater concern for women than for men (Padian, Shiboski, Glass, & Vittinghoff, 1997).

Three earlier studies conducted in Taiwan showed that women IDUs had adequate knowledge about HIV transmission, though a substantial number of women IDUs did practice drug-injecting behaviors and having unprotected sex with multiple partners (Lee, Fu, & Fleming, 2006; Lee, 2006; Lee, 2005). It still remains to be researched whether women IDUs recognize their HIV susceptibility while they know transmission routes of HIV, and if they practice safer injecting and/or sexual behaviors, respectively.

The purpose of this study is to examine whether the extent of HIV susceptibility is associated with injecting risks and sex risks after the harm reduction programs were delivered in Taiwan.

Methods

Because 70% of HIV cases related to IDU have been tested positive in the prison system, two large female prisons were selected as the research setting. After the introduction of study purposes and procedures, 254 female heroin offenders volunteered to fill in the questionnaire. Selection criteria for participation in this study were as follows: at least 18 years old, literate, history of injecting heroin, with sexual experiences, and HIV-negative. It took about 5 minutes to complete the questionnaire, and the data were collected between June and August 2007 with their consent forms. The contents of questionnaire consisted of background information, drug-use history, injection-related practices, sex-related risk behaviors, and measures of knowledge about AIDS transmission.

The HIV susceptibility was measured using the item: "How likely you think that you may be infected with HIV in the future?" on a 7-point scale coded from 1 to 7 corresponding to "very likely" to "no chance at all", respectively. The independent

variables used in the analysis were (a) age; (b) education; (c) having sexual partners who injected drugs; (d) condom use during the last sexual encounter; (e) needle and syringe sharing in the past year; (f) rinse water sharing in the past year; and (g) knowledge of AIDS transmission. Age was recoded into 3 categories: less than 30 years, 30-40 years, and more than 40 years. Education was recoded into 4 categories: less than 7 years, 7-9 years, 10-12 years and at least 12 years. Having IDU as sexual partner, last condom use, last needle and syringe sharing, and rinse water sharing were all coded as yes(1) and no(0). AIDS knowledge consisted of 5 items of HIV transmission routes (sex without condom, sharing of syringe, sharing of rinse water, giving birth, and breast feeding), and each correct answer was given 1 point with the highest possible score of 5.

Results

Table 1 presents background information of 246 participants who completed the questionnaire. Eight women were excluded from analysis because 2 were sexually inexperienced and 6 dropped out without completing the questionnaire. Of participants, the ages ranged from 22 to 60 years with a mean of 33.3 (SD=7.3). The majority had at least nine years education (75%). With regard to sex-related behaviors, about 48% reported

Table 1. Descriptive Characteristics of the Female IDUs (N=246)

Variables	(N)	Valid Percentage (%)
Age (years)		
<30	76	34.08
30-39	106	47.53
40 & over	41	18.38
Education (years)		
<7	30	12.88
7-9	95	40.77
10-12	96	41.20
>12	12	5.15
Sexual Partners Injecting Drugs		
Yes	118	47.96
No	128	52.03
Condom Use, Last Sexual Encounter		
Yes	41	16.94
No	201	83.05
Needle and Syringe Sharing, Past Year		
Yes	69	28.05
No	177	71.95
Rinse Water Sharing, Past Year		
Yes	102	41.63
No	143	58.37
	Mean	Std. Deviation
Score of AIDS transmission knowledge (0-5)	4.73	0.55

having IDU sexual partners and 17% using a condom during the last sexual encounter. Regarding injection-related practices, 28% of the participants shared needles with others and 42% shared rinse water with others in the past year. The total scores of AIDS transmission knowledge were generally high and approximately 79% of participants answered correctly on all five items.

Table 2 presents the results of a multiple regression on HIV susceptibility. The results showed that education, sexual partners

injecting drugs, no condom use during the last sexual encounter, and the score of AIDS transmission knowledge were not statistically significant with HIV susceptibility. However, age was significantly associated with HIV susceptibility, $\beta = 0.19$, $p < 0.01$. Needle and syringe sharing in the past year was significantly related with HIV susceptibility, $\beta = 0.17$, $p < 0.05$. Rinse water sharing in the past year was also significantly associated with HIV susceptibility, $\beta = 0.20$, $p < 0.05$.

Table 2. Multiple Regression on HIV Susceptibility (N=246)

	B	SE B	β
Age	0.04	0.01	0.19**
Education	-0.01	0.03	-0.02
Sexual Partners Injecting Drugs	0.26	0.19	0.09
Condom Use, Last Sexual Encounter	0.06	0.24	0.02
Needle and Syringe Sharing, Past Year	0.55	0.27	0.17*
Rinse Water Sharing, Past Year	0.59	0.24	0.20*
AIDS Transmission Knowledge Total Scores	0.04	0.17	0.02

Note. $R^2 = .21$. * $p < 0.05$; ** $p < 0.01$

Discussion

The aim of this study was to determine the associations of injecting and sexual risks with HIV susceptibility since sharing injecting paraphernalia was postulated as the main mode of HIV transmission amongst IDUs in Taiwan. There are three main results in this study. First, the results revealed that

only 17% participants used condoms during the last sexual encounter. The low rate of condom use was consistent with the studies by Worth (1989) and Magura, Shapiro, Siddiqi, & Lipton (1990), of sexually active drug users which found that only 2%-30% used condoms fairly regularly. Some studies conducted to investigate factors influencing condom use

among drug users found that individuals claimed lack of responsibility and less likelihood of using condoms when high on drugs (Kenen & Armstrong, 1992; Falck, Wang, Carlson, & Siegal, 1997).

Second, our results show that almost half of the participating female heroin users had sexual partners who also injected heroin. This result is consistent with an IDUs' sexual risk behavior study, in which Donoghoe (1992) indicated that in contrast to men, female IDUs were more likely to have a partner who injected drugs. Recent studies have shown that female IDUs in a sexual relationship with drug-injecting men may be at an elevated risk of HIV transmission (Davies & Dominy 1996; Strathdee & Sherman 2003). Therefore, AIDS prevention intervention should target at female IDUs with IDU sexual partners to avoid sex-related and injection-related risk behavior.

Third, age and sharing of needles and rinse water were predictive factors of HIV susceptibility of participants. The findings provide evidence that injection-related risk practices obviously associated with high HIV susceptibility of female IDUs, but sex-related risk practices did not. The results revealed that the interventions aimed at drug users were effective in assisting drug users in avoiding or modifying injecting risk behaviors, and therefore, the interventions should be implemented and expanded further.

Results from earlier studies in the

literature indicated that methadone treatment and needle exchange program interventions aimed at IDUs concentrated on drug-injecting behavior that have been found to be effective in reducing rates of sharing needles and rinse water, but mixed results showed that needle exchange and methadone programs have evidence of reducing unprotected sexual behavior among IDUs (Magura et al., 1990; Grella, Anglin, & Annon, 1996; Marsch, 1998; Needle, Coyle, Normand, Lambert, & Cesari, 1998; Empelen, Schaalma, Kok, & Jansen, 2001; Strathdee et al., 2001; Amato, Davoli, Perucci, Ferri, Faggiano, & Mattick, 2005; Prosser, Cohen, Steinfeld, Eisenberg, London, & Galyner, 2006.). The IDUs seem to continue practicing unsafe sex to a great extent, even if they are aware of the risks of heterosexual HIV transmission (Lee, et al., 2006; Magura et al., 1990).

Contrary to injection-related risk practices, this study reveals that sex-related risk behaviors were not statistically significant with HIV susceptibility of female IDUs. In Taiwan, the existent HIV intervention programs toward IDUs were principally devised to reduce the injection-related risk practices and the target of reducing the sex-related risk behaviors were ignored. This might be the reason why sex-related risk behaviors could not raise HIV susceptibility of female IDUs. Safer sex should be regarded of equal importance to safe injecting techniques in pursuing HIV

harm reduction for female drug users. The HIV intervention programs need not only to reduce the injection frequency and increase injection safety of female drug users, but also reduce their sex-related risk behaviors.

The IDUs experience greater difficulties changing their sexual behaviors than changing their injection risk practices (Somlai, Kelly, McAuliffe, Ksobiech, & Hackl, 2003). There is substantial evidence that many IDUs continue to engage in high-risk sexual behavior even after completing drug treatment programs and even after making changes to reduce their injection risk practices (Bryan, Fisher, Fisher, & Murray, 2000). Recently, some studies investigated the psychological factors and mechanisms associated with safer sex behavior change among IDUs, and found that the sexual relationship exerted the main effects on condoms use (Worth, 1989; Magura et al., 1990; Kenen & Armstrong, 1992). Dyadic relation and power control during sexual intercourse are two issues that deserve more research before a female barrier method that does not involve negotiation skills for women has been developed.

Several studies indicated that it was more difficult to encourage condom use in primary relationships (Sibthorpe, 1992; Falck et al., 1997; Polacsek, Celentano, O'Campo, & Santelli, 1999; Empelen et al., 2001). The culture in Taiwan is still conservative, which means that women are restricted in sexual expression and are reluctant to talk about

sexuality. The traditional gender role of women often lack control of sexual decision-making, and therefore increases the risk of HIV infection (Wingood & DiClemente, 1998; Lee et al., 2006). When compared with condom use, females found injecting drugs were easier to resort to, taking a decision by themselves to use clean the injection paraphernalia. Therefore, it is necessary to develop efficient HIV prevention programs that could raise the alarm of female IDUs, and further decrease their unsafe sex behavior. Our findings suggest that the comprehensive and multidimensional HIV prevention intervention for IDUs should include attention to not only reducing injection-related, but also to sex-related HIV risk behavior. In addition, effective communication skills about sexual practices in relationships between men and women, particularly the use of condoms, should be taught.

There were several limitations of this study. First, because of the cross-sectional nature, causal interpretations of study results should be considered tentative. It was noteworthy that the women who participated in this study were not randomly selected, and one would need to be cautious to generalize the results to women IDUs. Second, similar to most studies on sexual behavior and HIV prevention, this study relied on self-reported drug use behaviors, sexual behavior and condom use, which may be subject to

reporting bias (Lawrence, Eldridge, Reitman, Little, Shelby, & Brasfield, 1998). Reliability and validity of participants' reports of this study need further examination.

In summary, HIV susceptibility correlated with sharing of injecting equipments, but not with unprotected sexual practices amongst women heroin offenders. Hence, female IDUs may not be aware of HIV risks through sexual infection within the context of methadone treatment and needle provision programs, and consequently, women may ignore the importance of condom use while having sex. Future research should examine protective factors of condom use amongst female heroin users.

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台灣地區女性海洛因犯者之愛滋易感性與危險行爲

李思賢

文獻中有越來越多的研究結果指出，靜脈注射藥癮者在藥物使用的愛滋感染危險行爲因爲擔心感染愛滋而有減少的情形，但是在不安全性行爲的改變則較爲困難。本研究目的是探討女性靜脈注射藥癮者感染愛滋的易感性、危險性行爲、與藥物注射行爲間的關係。本研究總共有 254 位在 2006 年六月到八月間同意填寫問卷並簽署研究同意書，問卷內容包括背景資料、藥物使用史、注射藥物行爲、性行爲、愛滋易感性與愛滋傳染途徑知識。結果發現 48% 受訪者之性伴侶爲靜脈注射藥癮者，有在最後一次性交時有使用保險套。在藥物注射行爲方面，過去一年裡有 72% 沒有共用過針具，有 58% 沒有共用稀釋液。迴歸分析結果發現愛滋易感性與伴侶是靜脈注射藥癮者 ($\beta=0.09$, $p>0.05$) 和最後一次性交時使用保險套情形 ($\beta=0.02$, $p>0.05$) 沒有達到統計上顯著。愛滋易感性與年齡 ($\beta=0.19$, $p<0.01$)、過去一年共用針具 ($\beta=0.17$, $p<0.05$) 與過去一年共用稀釋液 ($\beta=0.20$, $p<0.05$) 達到統計上顯著。本研究結果發現共用針具與稀釋液行能提昇女性靜脈注射藥癮者的愛滋易感性，然而危險性行爲則無法和愛滋易感性有關；這樣的結果顯示對於女性靜脈注射藥癮者的愛滋與性教育需要盡快加強。

關鍵詞：女性靜脈注射藥癮者、愛滋病毒、藥物注射危險行爲、危險性行爲、易感性

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