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ORIGINAL ARTICLE

Transitions to Injecting and Risk of Hepatitis C Transmission among Ethnic Vietnamese Heroin Smokers in Melbourne, Australia

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Background and Aims: **To examine factors associated with transition from non-injecting to injecting routes of drug administration and testing antibody positive to hepatitis C virus (HCV) among ethnic Vietnamese heroin users in Melbourne, Australia.**

Methods: **In a cross-sectional convenience survey, sample recruited by peer-workers using snowball sampling technique with a finger prick blood collection. Two-hundred ethnic Vietnamese heroin users were recruited and interviews conducted mainly in Footscray, an area of high ethnic Vietnamese residency with a prominent street based drug market. A structured questionnaire was administered. Measures included patterns of drug use, transition from smoking to injecting and vice versa, injection related risk behaviours and HCV sero-status.**

Results: **Ninety-three percent of the sample commenced drug use by non-injecting routes of administration. More than a half had made the transition from smoking to injecting and almost two thirds of participants had ever injected. The factors associated with making this transition included being male and a longer duration of use. Prevalence of exposure to HCV among injectors was over 50%. Factors associated with being HCV positive were longer duration of injecting, sharing injecting equipment and being older.**

Conclusions: **Smoking heroin is a common route of drug administration among heroin users of Vietnamese ethnicity in this study. The transition from smoking to injecting was very common in the sample. The need for targeted harm reduction initiatives is indicated, and these must take into account patterns of heroin use as well as the social context of drug use if we are to work effectively with heroin users of Vietnamese ethnicity.**

Keywords: **Hepatitis C, Injecting Drug Use, Inhalation, Social Environment**

Introduction

The sharing of needles and syringes while injecting illicit drugs means that hepatitis C virus (HCV) is the most common infectious disease to affect people who inject drugs. Parenteral exposure is the major risk factor for HCV infection in Australia [(1)], North America [(2)], the United Kingdom [(3)], Europe [(4)], and many developing countries including Vietnam [(5)] and China [(6)]. Blood-borne viruses like HCV are public health problems of global significance with more than 2%

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of people worldwide thought to be infected with HCV [7]. In Australia, injecting drug use accounts for at least 80 percent of total cases with most previous prevalence studies finding that between 50 and 80 percent of IDU are believed to have been exposed to HCV [1, 8]. In 2003, it was estimated that more than 240,000 people have been infected with HCV in Australia [9] and among these; an estimated 134,000 have developed HCV chronic infection. While less than 500 cases of newly acquired HCV infection are notified each year in Australia, an estimated 16,000 new infections occur annually [10], and 90% of these are attributed to people who report injecting drugs [11].

HCV infection frequently occurs early in a drug user career, even before the user seeks help or advice for any drug related problem [12-14]. Among injecting drug users who do not share syringes, some HCV infections may be attributed to the sharing of other injecting equipment such as cookers/ cottons/filters [13-15]. HCV is not classified as a sexually transmitted infection and cases of sexual transmission are thought to be extremely rare [16, 17]. Heroin can be administered through non-injected routes or can be injected (usually intravenously). Non-injecting routes include intranasal use (sniffing), chasing the dragon (inhaling vaporized heroin after heating it on tinfoil) and smoking heroin in cigarettes and/or mixed with marijuana (snow-cone). Smoking heroin has been increasingly evident in Australia with a study in South West Sydney reporting heroin smoking as a common route of drug administration among young Indochinese heroin users with more than a half of the sample commencing heroin use by smoking [18]. Of these, 34% made a transition to injecting.

When non-injecting drug users make the transition to injecting, the risk of acquiring blood-borne diseases increases and given this there continues to be considerable public health interest in understanding more clearly why some non-injection drug users make the transition and whether limiting this is both feasible and practical [19]. With this in mind we designed a study to examine the patterns of drug use associated with the transition to injecting among heroin smokers and to determine rates of HCV exposure for both smokers and injectors of heroin.

Materials and Methods

Study design

The study ran from late 1999 to mid 2000 and was based in Footscray, Melbourne. It was a peer focussed quantitative study with ethnic Vietnamese peer interviewers being recruited primarily through the established networks of the study investigators. The selection process for peer interviewers included an assessment and interview by the first two authors (PH & JK). Selection was based on previously determined criteria, including experience of heroin use, proficiency in English language, good communication skills, access to other ethnic Vietnamese heroin users, interest in drug use research and commitment to the project. Eleven people were invited to join an intensive training program which was mandatory for all potential peer interviewers. The median age of the interviewers was 20 years (range: 18-38). Two of the peer interviewers were female. After 20 hours of training, the peer interviewers were directed to contact other heroin users through chain referral within their own personal and social networks and to invite them to participate in the study. Both heroin smokers and injectors were eligible to participate in the study as long as they were ethnic Vietnamese (as determined by language spoken, country of birth or parent's birth and self-identified ethnicity) and had used heroin at least once in the last six months. Informed consent was obtained prior to the interview.

Data and specimens collection

The study instrument was a structured questionnaire available in both Vietnamese and English. The 80 questions covering basic demographics; drug use history, transitions between different routes of administration were extensively trialled by the peer workers within the group and piloted with eleven potential participants outside the group prior to implementation. The questionnaire was translated from English into Vietnamese by a qualified translator and back translated with support from the peer interviewers to ensure equivalency. It was available in both languages. To ensure optimal reliability of the self-reported information several strategies were used: use of peers as interviewers, conducting one-to-one interviews in a relaxed and private setting and production of an information sheet for respondents. Peer interviewers were also encouraged to explain in some detail the nature of the research and the need for accurate information. Capillary blood specimens were collected by peer workers on blotting paper by finger prick with single-use lancets. Antibody testing for hepatitis C was performed using a modified third generation enzyme immunoassay (Abbott HCV EIA 3.0, Chicago, USA). Specimens were considered positive for HCV antibody if the optical

density to cut-off ratio was greater than or equal to 1.35 on initial and subsequent testing.

Data analysis

Data were initially entered into an SPSS database and double-checked. STATA software (version 7.0) was used to analyse data. Percentages were used for categorical variables; means were used for normally distributed continuous variables, medians were presented instead of means if continuous variables were skew. Univariate analyses were used for major variables of interest identified from literature and ongoing ethnographic research. Chi-squared test and unadjusted odds ratios were used for categorical variables. Student's *t*-test and Mann-Whitney test were used for normally distributed and skewed data, respectively. The 0.05 probability level was adopted for all tests. A logistic regression model was used to determine associations with the transition from smoking to injecting, and HCV seropositivity. Variables were selected into the model based on prior knowledge and the significance of odds ratio in univariate analysis.

Results

Two-hundred interviews with heroin users of Vietnamese ethnicity across the western suburbs of Melbourne were conducted by peer interviewers in English (n=173) and Vietnamese (n=27). A majority of the interviews (66%) were conducted at the shop front office of the project. The remaining interviews were conducted in homes, cafes and other public spaces chosen by the interviewers and respondents. Female heroin users in this sample were younger on average than their male counterparts (19.8 vs. 24.5, P<0.0001) and made up 20% (n=40) of participants. The age of participants ranged from 15 to 49, with a mean of 22.7 years. Seventy three percent of participants in this study were under 25 year of age.

Heroin use

The average age of first heroin use was 17 years (range: 11 to 24 years). Most participants (92%) started using heroin in Australia and most began by non-injecting routes of administration, with smoking or burning being the most prominent (83%). At the time of interview, the participants had used heroin for an average duration of 5.5 years (range from less than 1 year to 19 years). Most participants (61.5%) had ever injected heroin prior to interview and heroin was the first injected drug for the entire sample. Among the injectors in the sample 95% first injected in Australia the others having done so in Vietnam or a refugee camp on their way to Australia. The average age of participants at first injection of heroin was 19 years (range: 13 to 26 years). For injecting heroin users, the average duration of injecting was 4.5 years (range from less than 1 year to 10 years).

Most participants (95%, n=191) had used heroin either on the street or other public places in the six months prior to interview. Of these, 34.5% (n=66) used heroin on the street daily. Public toilets and cars were the main places nominated by participants as the places where they used. About half of the respondents to the study reported having used in a public setting even when they did not purchase their heroin from the street market. Male heroin users in this sample were over seven times more likely to have ever injected heroin than the female users interviewed (P<0.0001). Injecting heroin was also associated with age and duration of use. Participants who were 20 years or older were four times more likely have injected than people younger than 20 years of age (P<0.001). The injectors in the sample had used heroin for longer on average than their non-injecting counterparts (6.9 years vs. 3.2 years; P<0.001).

Transitions from smoking to injecting heroin

More than a half of the participants (53%) who started heroin use by non-injecting routes of administration had switched to injecting prior to being interviewed. The main reasons for this transition cited by participants included: cheaper/stronger method (43%), curiosity (15%), for the rush (33%) and peer pressure (6%). Females were significantly less likely to have ever made the transition from smoking to injecting; only six (15%) made the transition compared to 96 males (60%) (OR=0.12; 95% CI: 0.04-0.31). There was no significant difference in the length of time in making this transition between the male and female heroin users in the study.

The average time between initiating heroin use and switching to injecting was 2.7 years with a range from less than 1 year to 10 years. Participants who smoked heroin for 5 years or more were 4.8 times more likely to have switched to injecting relative to those who had smoked for a shorter period of time (95% CI: 2.45-9.43; P<0.001). Those who used heroin on the street and in public places on a daily basis were also more likely to make the transition from smoking to injecting relative to those who used less frequently or never in public places (OR=3.26; 95% CI: 1.34-5.91; P<0.0001). Twenty one per cent of the injectors in our study had made a reverse

transition from injecting to smoking at some stage in the previous 6 months.

Hepatitis C

About half of the sample (104 respondents) reported they had been previously tested for HCV. Of these, 28 respondents (27%) claimed a previous positive HCV antibody test result five of whom were actually antibody negative when their sample was tested. Seventy respondents previously tested reported being HCV negative nineteen of whom tested HCV antibody positive. Only 6 respondents (6%) did not know or remember their HCV result and 3 of them were HCV antibody positive. Over 95% of HCV positive cases were among the injectors. The overall rate of HCV for the sample was 37% (95% CI: 29.61-44.28). However, when looking only at the injectors in the sample, the HCV antibody rate was 56% (95% CI: 45.22-64.41). Only four respondents who reported never injecting tested HCV antibody positive.

Being HCV antibody positive was strongly associated with duration of use. As duration of use increased so too did the likelihood of an HCV antibody positive test result. The injectors in the sample who had used for more than 5 years were 4.54 times (95% CI: 1.79-11.84; P<0.001) more likely to be HCV antibody positive relative to IDUs who had used for less than five years. HCV seropositivity was strongly associated with age. The risk of being HCV antibody positive among IDU participants who were 20 years or older was 11.84 times greater than those IDUs aged under 20. HCV infection was strongly associated with being a current injector of heroin. Respondents who tested positive to hepatitis C antibodies were 34 times more likely to have ever injected heroin. Respondents who reported having a previous HCV test were also more likely to be current injectors.

Similarly, HCV serostatus was strongly associated with duration of injecting. Those who had been injecting for more than 5 years were 8.64 times more likely to be HCV antibody positive relative to those who had been injecting for less than 5 years. The sharing of injecting equipment was associated with increased risk of being hepatitis C positive. Fifty-two per cent of injectors reported re-using syringes and needles (usually their own needle or syringe) at some stage in their injecting careers. The proportion of injectors who reported ever shared syringes and needles was 18%. Injectors who shared needles and syringes in the last six months were 3.48 times more likely to test positive to hepatitis C antibodies when compared with those who did not report such sharing (95% CI: 0.98-15.48; P<0.01).

Discussion

Although the majority of participants began their heroin using careers by smoking, more than half had switched to injecting by the time of their interview in this study. Risk factors for this transition identified by this study were a longer duration of using heroin, using in public places and being male. The overall rate of HCV in this sample was 37%, but this proportion rose to 56% amongst those who had ever injected. Similar to other research on hepatitis C exposure for participants in this study HCV seropositivity was associated with increased age and duration of use, injecting heroin and duration of injecting and the sharing of injecting equipment [2, 12].

The reported reasons for making the transition from smoking to injecting in this study are similar to others in the literature. The perceived benefits of injecting over other routes in cost-effectiveness and strength of drug "rush" have been reported in other similar studies [18, 20]. The reasons why ethnic Vietnamese female heroin users in the sample were much less likely to make the transition to injecting cannot be explained by the results of study itself. Overseas studies have found that the stigma associated with injecting lowers the risk of transition to injecting [21]. The social stigma and shame associated with injecting may well contribute to the reluctance of ethnic Vietnamese female heroin users to take up injecting. The younger age of the female participants in the sample (19.5 years vs. 23.5 years; P<0.001) may also be a confounding factor in their preference for non-injecting methods of administration. The design and implementation of longitudinal studies may help to answer this question in the longer term.

One fifth of the injectors in this study had made a reverse transition from injecting to smoking at some stage in the 6 months prior to interview. This result was in contrast with an earlier Sydney based study which reported that none of the Indochinese participants (mainly ethnic Vietnamese) had made a reverse transition from injecting to smoking and only 3% of Caucasian respondents had ever done so [18]. This change is a positive observation and the reasons behind reverse transitions warrant further investigation. The results of our study showed that the risk of exposure to HCV was not significantly different among those who had switched from smoking to injecting or those who had made a reverse transition. Given the cross-sectional design of the study, it is impossible to identify when HCV infection occurred in the drug user's career. Nonetheless almost a third (14 participants) of those

who had been using for two years or less were already HCV anti-body positive. Studies have shown that many drug users are infected soon after their initiation to injecting [13, 20] and that this is a crucial time for developing HCV prevention interventions.

This study reports a lower prevalence of HCV among the injectors in the sample in comparison with previous studies conducted with this population in Melbourne [22]. Subsequent studies with this population group in Melbourne have continued to report positive HCV antibody status at around 80% [23, 24]. The explanation we offer for this discrepancy is that many of the study participants were young (55% of the sample was aged 21 years or younger) and had used for only short periods of time compared to participants in other studies. Furthermore, unlike these studies, in which only injectors were tested for exposure to HCV, this sample included also exclusive heroin smokers. Sharing injecting equipment, and in particular needles and syringes, remains the highest concern with regards to HCV transmission and infection. Among this sample the risk of HCV seropositivity was more than three times greater amongst those who reported needle sharing than those who did not. The proportion of injectors who shared syringes and needles (18%) in the previous month was comparable with previous studies of ethnic Vietnamese drug users (22%) [13] and the 17% of people who reported re-suing a needle or syringe after someone else had used it in a national study of attendees to needle and syringe programs in Australia [25].

Some evidence has been produced of other possible routes of HCV transmission amongst Vietnamese-born people who do not report a history of drug use [26] but these explanations among this sample are unlikely, in most part due to the young age of participants and the fact that many of them would not have experienced the exposure risks reported above (common cultural and medical practices) which tended to occur in Vietnam. A substantial majority of participants had used heroin on the streets or in public places. The public use of heroin has created a great deal of concern not only from local traders and shoppers in the local neighborhood of Footscray. This high profile use of heroin has created an environment for increased police attention in these street based markets. The public health risks for individual heroin users as well as to the law enforcement personnel are well documented [27, 28] and important to consider when determining the best strategies for managing street based drug markets.

Conclusions

Our study found that risk behaviours including re-using and sharing injecting equipment among this group were common. Our study indicates the need for targeted, research and evidence based initiatives which take into account patterns of drug use as well as social and cultural characteristics and contexts of use by ethnic Vietnamese heroin users. The specific challenges of street based drug scenes and the specific needs of users of Vietnamese ethnicity are not easily accommodated by mainstream services or traditional forms of service delivery. The development of locally based primary health care centres goes some way towards helping alleviate the harms encountered by many of the most problematic illicit heroin users we interviewed. A continued commitment to the development of services which account for these challenges is an important component of effective harm reduction based service provision.

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