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Strategies to Avoid Opiate Withdrawal: Implications for HCV and HIV Risks

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Introduction

For heroin users, one of the most difficult aspects of their drug dependency is facing symptoms associated with heroin withdrawal. On the street, these symptoms are known as “dope sickness” or simply being “sick.” Oftentimes, injection drug users (IDUs) first become aware of their heroin dependency through experiencing withdrawal symptoms. Severity and duration of withdrawal is greater among injectors than among smokers as well as greater among those with higher heroin dose (Smolka and Schmidt 1999, Gossop et al. 1993). Risk of withdrawal can also be intensified with cocaine use (Tyndall et al., 2003). During periods of withdrawal, IDUs are more likely to engage in risky injection practices (Ross et al. 1994; Connors 1994; Stein et al. 2007; Craine et al. 2002; Rhodes and Treloar 2008). Withdrawal can lead IDUs to postpone thinking about the consequences of HIV risk (Hughes, 2004) and undermining normative non-needle sharing behaviour (Grund, Kaplan, & Adriaans 1991; Ross et al. 1994; Gossop et al. 1993). Researchers have reported the existence of norms regarding reciprocal drug sharing among IDUs to help coping with withdrawal (Grund et al. 1996; Bourgois 1998; Hahn et al. 2002); not engaging on such solidarity sharing practices, despite its known HIV risk, can lead to losing moral standing among injecting peers (Plumridge and Chetwynd 1998). In IDUs hierarchy of risk, overcoming withdrawal becomes a competing priority to avoiding infection (Connors, 1992).

In this paper, we discuss how heroin withdrawal can enhance HIV and/or HCV infection risk, and discuss strategies and tactics developed by some long-term New York City IDUs aimed at avoiding withdrawal-facilitated injection risk and/or keeping withdrawal episodes to a minimum. These strategies and tactics can enhance IDUs’ ability to remain uninfected by (a) controlling their drug consumption at affordable levels and thus avoiding risk-enhancing withdrawal; (b) avoiding risky situations (e.g. shooting galleries and other ad hoc sharing settings); and (c) minimizing severe withdrawal symptoms leading to a rushed (and often unsafe) injection.

The data presented here indicate that, despite addiction, many IDUs exercise a significant degree of control over their dependence by regulating consumption and seeking periods of abstinence. Other researchers characterized self-regulating behaviours as being dependent on drugs’ pharmacological qualities, users’ psychological characteristics and internalised norms and structural components (Zinberg 1984; Grund 1993; Shewan et al. 1998; Warburton et al. 2005). Drug use falls within the spectrum of either “controlled” (limited drug intake with low social costs) or “compulsive” (high intake and high social costs). Our research provides evidence that, even among compulsive users, there is a great deal of self-regulatory behaviour,

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and describes how these behaviours could be an important factor in preventing HIV and HCV infections in the long term.

These results also put into question biomedical findings suggesting that long-term drug use affects “the very circuits needed to exert good judgment and inhibitory control over actions” (Volkow 2008). From current and past research, it seems there is a great deal of rational choice and management over drug intake among long-term users. Additionally, these findings question criminal justice calculations of the cost of addiction and the amounts of economic crime committed by users to support their drug use (Brand and Price 2000, Godfrey et al. 2000), suggesting that such cost estimates oversimplify the relationship between drug consumption and criminal income generation.

Methods

The Staying Safe project aims to discover how IDUs who have been injecting drugs for a long period of time have remained uninfected by either HIV or HCV. Based on the concept of “positive deviance”, the study of individuals whose practices, strategies and behaviours enable them to function more effectively than others within a given social context (Sternin & Choo 2000, Wray 1972; Zeitlin, Ghassemi, & Mansour 1990), we developed a method we have termed Positive Deviance Control-Case Life History (Friedman et al. 2008). This method uses life history interviews to compare the “doubly uninfected” (HIV-, HCV-) “controls” with those that are “double-positive” “cases” (HIV+, HCV+) and the “single positives” who are infected with HCV but not HIV (HIV-, HCV+). We recruited 32 IDUs in New York City who have been injecting drugs for 8-15 years. Instead of inquiring only about “risk factors,” we also focused on living conditions, strategies for maintaining their drug use and prevention tactics related to injection practices over the long-term. This paper, however, is not primarily based on the control-case comparison, but rather on the study of withdrawal management practices among 32 subjects (21 doubly uninfected IDUs, 3 doubly infected, and 8 singly infected with HCV.) Control-case comparisons do form the basis for one subsection in the results below, which compares positive cases and uninfected controls.

Participants were either referred by other research projects or by a drug detoxification centre. Two-part, in-depth interviews were carried out with each subject. To start, we created a “timeline” of each participant’s life to be used in structuring and facilitating subsequent parts of the interview. To facilitate recollection, we drew a visual timeline that chronologically arranged life events along 9 different themes: family; education; relationships and sexual partners; jobs and other sources of income; drug use and drug injection; arrests, jail and incarceration; drug treatments; hospitalisation and medical conditions; living situations (e.g. homelessness). Afterwards, we elicited a more detailed narrative about their history and experiences with drug use, injection networks, and practices and strategies to avoid stigma, high-risk situations and infection. We also inquired about changes in drug injection practices as they related to chronological events outlined on the timeline. To facilitate analysis, we wrote short “vignettes” which included subjects’ biographical highlights and summaries of their drug use, knowledge regarding HIV and HCV, injection practices, networks and needle sources.

Grounded theory (Glaser, 1992) analytic techniques sought patterns in these data and developed emergent hypotheses about them. We coded practices and strategies aimed at staying safe from HIV or HCV infection, among others. These actions were coded broadly to include any behaviour that aimed at protecting against infection or other physical (e.g., abscesses) or social harm (e.g., stigma, incarceration). We coded more than one hundred practices and strategies including tactics such as buying from known dealers to avoid poor quality drugs, injecting in shooting galleries to avoid arrest, accessing methadone programs to avoid engaging in criminal behaviour, and injecting alone to avoid infection or conflict over sharing drugs.

Elsewhere, we have reported how some of the goals motivating these safety behaviours, although not directly focused upon disease-prevention, may nevertheless help reduce transmission risk (Friedman et al. in press).

We also looked at strategies subjects had engaged in to use drugs safely such as avoiding shooting galleries to avoid infection; using multiple needle exchange programs to secure continual access to “clean needles”; asking potential syringe sharing partners about their HIV status to determine whether or not to share syringes; and sniffing rather than injecting. Withdrawal (e.g., managing drug consumption, severity of symptoms, coping strategies) emerged as a core category interrelated to safety threats and injection safety (e.g., withdrawal leading to use of “dirty needles”; high dose intake leading to criminal behaviour; resorting to shooting galleries to access drugs). This paper outlines our effort to make sense of such rich complexities. We first present ways in which withdrawal symptoms can enhance risk. Then we describe how some IDUs avoid opioid withdrawal (“dope sickness”) and/or manage periods of withdrawal without engaging in unsafe injection. Finally, we compare withdrawal prevention strategies and coping practices between uninfected and infected subjects.

Results

Heroin Withdrawal And Injection Risk

When a period of sustained heroin use is discontinued or interrupted, the user experiences painful withdrawal symptoms. Signs and symptoms of opiate withdrawal include yawning, sweating, lacrimation, rhinorrhea, anxiety, restlessness, insomnia, dilated pupils, piloerection, chills, tachycardia, hypertension, nausea/vomiting, abdominal pains, diarrhoea and muscle aches and pains (Gordon and Dahl 2007). Other researchers (Smolka and Schmidt 1999) have shown a greater severity of opiate withdrawal among injectors and those using higher doses. In our study, while most subjects report severe withdrawal symptoms and difficulty in coping with them, four subjects reported significantly more ease in managing withdrawal due to experiencing less severe pain. In the following excerpt, subject 007 (HIV and HCV negative) describes his various withdrawal experiences during 9 years of use:

I couldn't function, I mean diarrhoea, nausea, dizziness, weakness, where I would get up and have “spaghetti legs” and I couldn't walk. I've actually pooped on myself about six times since I started using drugs, where you can't control the cramps and you lay a fart-excuse me- and all of a sudden shit starts dripping down your leg. I wanted to avoid that.

Once these heroin users understood the cause of these symptoms, which they often learn by being told by a fellow IDU, they engaged in regular heroin consumption to avoid withdrawal. As dependence develops, amounts of heroin consumed can vary widely from user to user and from time to time. Some IDUs will inject 2-3 bags daily (heroin bags in New York City contain 0.1-0.2 grams and sell for \$10 a bag). Others might consume 10 or more bags daily (at a cost of \$100 or more a day). Many subjects reported periods as long as 6 months to a year, with daily consumption of 15-20 bags (with a daily cost of \$150 to \$200). Subjects' reports of variability of drug intake over a wide time range diminished concern over potential bias in over reporting use (Booth & Baker, 1987).

After injectors develop a “habit” requiring regular drug consumption, three processes take place:

- a. Routinisation of drug consumption. Injection becomes a daily or more frequent routine. Considerable amounts of daily time and energy go into drug seeking in an uncertain illicit market, as well as into income-generating activities to pay for the drugs.

- b. Increasing body tolerance. Regular exposure to heroin results in a decrease of the drug's effects over time (Gordon and Dahl 2007). As a result, a user requires increasingly higher dosages to reach a similar drug effect (whether a euphoric "high" or decrease in withdrawal symptoms).
- c. Increasing cost. Routine drug consumption leads to regular expenditure on drugs while increasing tolerance tends to escalate the size of those regular expenses. Money assigned to drugs becomes a priority, diminishing the ability to assign income to other needs. This problem is compounded by the variability of drug purity in illicit markets.

These processes lead to a widening disparity between the amount of heroin needed to avoid withdrawal and the money available to purchase drugs. This can result in a progressive deterioration of IDUs' economic standing and ability to finance their own drug use.

In our research, we found that heroin withdrawal can increase injection risk by: (a) undermining willingness and ability to inject safely; (b) leading to injection in risky settings; (c) increasing the number of injection partners; or (d) seeking ad-hoc partners for drug or syringe sharing.

The disparity between the dosage needed to avoid withdrawal and available money to buy drugs often leads to periods of forced withdrawal. These periods of "dope sickness" are moments of exceptional vulnerability to HIV and HCV because they increase the likelihood of risky injection practices. The short-term "need" for IDUs to cure dope sickness undermines their willingness to inject safely: addressing immediate pain overrides long-term concerns over infections. The following excerpt from subject 023 (HIV negative, HCV positive) illustrates these —situationally— competing priorities:

As a heroin addict, you are more scared of being sick at the time than worrying about if you going to catch disease, because you know that you not going to die instantly. You know, I worry about the later consequences later, right now I just want to get off E ["off empty" referring to lack of heroin], I just want to get all right. Never in my mind I was about, "Oh, should I get a needle from this guy? No, no, no, no. I'm sick right now, I just, can I use your syringe?"

Some IDUs refer to these risky withdrawal periods as being "desperate" or "in desperate mode". During "desperate mode," basic (and otherwise routine) safe injection practices are often overridden by the immediate pressing need to overcome withdrawal:

It wasn't to the point where we were like, desperate, desperate, desperate, like I've seen people. I've seen users to a point where they are so desperate that they will take somebody else's syringe or whatever and shoot up. (Subject 009, HIV and HCV negative)

Some users will go to areas (e.g., shooting galleries) where other IDUs gather to ask others for some of their drugs, the remains in a syringe or hoping for "spill-overs" (when someone who has plenty of drugs gives to others present). In this case, being in a shooting gallery did not lead to sharing, though it often does (Celentano et. al. 1991). In the following excerpt, subject 025 (HIV negative and HCV positive) describes how he attended a friend's shooting gallery where he received drugs from others:

Interviewer: So, you did go to the shooting galleries?

Subject 025: Yeah, 'cause it was near my house, and at the time I was living alone.

Interviewer: All right. So, then when you went there what do you do there? Subject 025: Wait for somebody to give me something, or-Interviewer: Oh, they give you some?

Subject 025: Yeah. Yeah, yeah, cause I knew the guy, the owner of the apartment. So, when somebody comes, everybody gets some.

Everybody that is in there, got to get high. 'Cause he, the owner, says if you come, you want to do your thing there, you come, you give him some.

His stuff [drugs] and he will give me some just like that.

When heroin is scarce and resources are limited, some subjects report seeking partnerships with others to enhance their ability to get funds or to combine funds to buy drugs. Such efforts often lead to group injection. To assure access to drugs, they develop a wide network within which those who have drugs will share them with the implicit understanding that, when the situation is reversed, they will receive drugs from others. At times, these reciprocity expectations lead to risky situations such as sharing a drug solution with one syringe or serosorting (inquiring a fellow injector's HIV and/or HCV serostatus to determine whether or not to share "needles"; if both injectors share the same serostatus, sharing "needles" is perceived to be safe).

There are times when a user feels early symptoms of withdrawal and she or he becomes anxious that the worst yet to come. In such circumstances, users might resort to their most immediate source for either injection equipment and/or drugs, even at their own risk. In this excerpt, subject 023 (HCV positive, HIV negative) describes one of the very few occasions when he shared needles. It was past midnight, and he had heroin but not a syringe.

In pursuit of a syringe, he went to the only place where he thought could find it: the "stroll" (street location where sex workers gather).

My needle would break, or the little sponge would get while, get clogged up with the blood, and I would go out and try and find a needle but I couldn't. One thing I did do one time was, there was a prostitute in Newark, it was about three o'clock in the morning. [...] She thought I'd come to pick her up, [...] I say, "Yo, listen mom." She's like, "What's up, pa, what do you want?" I'm like "Listen, I'm just looking for some wrench [injection equipment]." She's like, she looked around, she's like, "You ain't no cop?" I'm like, "No, mama I'm not a cop, sick as hell. You can hook me up [give me your syringe]." She's like, "Well I got mine, you know it's used." Like, "You don't know where I can get a new one?" She's like, "Shhh, not right now." I was like "Yo, come on, come in the car and I'll hook you up [give you some drugs]." She's like, "You got me? [you will really give me some drugs?]" I was like "Yeah." I said, "You got some water? I'll just clean it out with water." You know, I used it.

Reducing the Impact of Withdrawal on Safe Drug Intake Practices

In the preceding section, we discussed ways in which withdrawal can lead to unsafe injection practices by undermining willingness to inject safely. Despite this enhanced risk, many of our subjects have developed strategies and practices aimed at maintaining safe injection practices while enduring withdrawal.

Some IDUs are aware of the increased risk associated with attending group injection settings and take precautions accordingly. For example, subject 025 (HCV positive and HIV negative) would carry multiple clean syringes when he attended shooting galleries, to ensure that he would have safe "needles" for his own use as well as additional "needles" that could be traded in exchange for drugs. By carrying clean needles, 025 avoided sharing needles and other injection equipment which are common practices in shooting galleries (Celentano et. al. 1991). Others develop ways to tell fellow users about their unwillingness to share needles without coming across as overly greedy or condescending.

Another simple and yet useful strategy to remain safe while avoiding withdrawal symptoms is sniffing the drug rather than injecting it if no clean syringes are available (in United States, in contrast with Europe and other parts of the world, smoking heroin is relatively rare (Strang et al. 1997). Sniffing heroin alleviates withdrawal symptoms while providing time to access more drugs and clean injection equipment. Although this might seem an obvious strategy, many IDUs do not sniff once they have started injecting. Sniffing is considered a less efficient route of administration and it takes longer for the drug to have its effect. For many, sniffing is considered a wasteful practice. In the following excerpt subject 004 (HIV and HCV negative) describes his choice of sniffing rather than injecting as part of his being a “responsible junkie”.

Interviewer: Has that ever that you were so sick that you were like willing to take somebody else’s works [syringes]?

Subject 004: I wouldn’t take nobody else’s works.

Interviewer: Even though you are very sick?

Subject 004: I’m not taking them. I’ll sniff the bag. I’ll sniff it. I’m not taking no works of nobody else.

Interviewer: And this is because? What makes you different than Green [fellow injector], I need to understand that. You guys inject together. What makes you do different than Green regarding the needle business?

Subject 004: He’s reckless. He just, he do anything to get high. He’s a bona fide junkie, you see what I’m saying. I’m a junkie but I’m not, I’m not an irresponsible junkie.

Overall, these strategies enhance IDUs’ ability to remain uninfected while enduring periods of withdrawal. However, IDUs are aware that, despite the best intentions, withdrawal episodes can lead to very risky behaviours. After difficult withdrawal experiences in which they had engaged in unsafe injection practices or in undesired behaviour (e.g., robbery or shoplifting), many conclude that the best way to avoid undesirable consequences was to avoid withdrawal altogether. Accordingly, they develop strategies aiming at coping with dependence while avoiding withdrawals.

Preventing Withdrawal

After experiencing periods of withdrawal due to lack of heroin, some IDUs develop tactics to prevent similar experiences in the future. Some, in times of plenty, store so-called “back-up bag(s)” of heroin in a safe place—inaccessible or unknown to other users—to which they can resort in periods of money difficulties or drug shortages. Others reported they store methadone, assuring they will have an alternative for consumption when they do not have heroin:

I got so sick those two times. It is unbelievable. Since then I always have methadone or a bag or two of heroin so I don’t get sick. I just make sure that I don’t get sick. It’s a back-up. See what I always do, I take a couple of bags put them on the side, put them somewhere where I can’t reach them [...] In case I don’t have money you know I can always have my methadone. So I don’t get sick. (Subject 013, HIV and HCV negative)

Some IDUs would resort to their prescribed medications to help alleviate withdrawal symptoms. Some use prescribed opiate or opioid medications, while others, more surprisingly, use medication prescribed for their mental illnesses (e.g. bipolar disorder, depression) as “transitional medication” to help them cope until they have access to heroin.

Many subjects make sure they have a “morning bag” or “wake-up bag” before going to sleep, setting aside one or two bags the night before for their morning dose. This dose is critical, since if the user does not consume an adequate dose of heroin shortly after awakening, “full-blown

symptoms” of withdrawal can quickly develop. In the following excerpt subject 012 (HIV and HCV negative) describes how he started saving some heroin for the morning:

Because after I found out I had a habit, I was not going through what I went through that day [day of a difficult withdrawal]—oh, my God. I always made sure I had two wake up bags.

IDUs may adapt their efforts to secure a steady supply of drugs to their own abilities to control their use. Thus, although saving some drugs for later use might be a sound strategy for some IDUs, others prefer to “buy as they go” because they would otherwise consume all the heroin available at a given time. This strategy is described by subject 004 (HIV and HCV negative):

I go home tonight. I go and I buy me two bags. I buy two 'cause if I buy four bags I'm going to do it all. I never buy more than I'm going to use.

Other users, in order to ensure a steady supply of heroin, develop a system of credit— either “drug credit” with their regular dealers or “money credit” with family or neighbours. Under this trust-based credit, IDUs either ask their dealers for drugs on credit or ask family, friends or neighbours to advance money to buy drugs. IDUs make certain to pay back those from whom they borrow in order to keep the relationship in good standing so they can borrow again. With such “micro credits”, IDUs are able to avoid withdrawal; after taking their dose of heroin, they are functional and thus are more able to engage in income generating activities:

I tell [the dealer] “Look, man, I don't got nothing. I'm sick. You know I'm gonna come back later with the shit [money] and I need 4 bags, 5 bags” “Yeah, man,” [the dealer replies] “I'm gonna give you the 5 bags but you better come back with my money alright.” I come back later on 'cause I did something. “Here's your money and give me 2 bundles [20 bags].”

You know what I'm saying 'cause that's the whole thing. If I buy bundles on the side from you, how you not gonna, you know, look out for me [give me credit]? (Subject 004; HIV and HCV negative)

In the following excerpt, subject 026 (HCV positive and HIV negative) describes how he resorts to family and friends to borrow money for drugs.

I could always go to somebody and ask them for ten dollars just to get me off.

I can go to my girl, I can to my mother, I can go to my girl's grandmother, I can go to any my boys' parents, any of my boys. Just loan me ten dollars, “Let me spend twenty dollars, I'll give it back to you.”

Although collaboration between drug users (e.g. sharing drugs, pooling money to buy drugs, etc) has been reported as a pathway to heightened injection risk (Koester, Booth, & Zhang 1996; Bourgois, 1998; Connors 1994), some subjects will cooperate with fellow injectors in ways that enhance their ability to access drugs and needles while avoiding sharing injection equipment:

We would actually cooperate. Like, I'd get the drugs, she'd get the needles.

Or she'd do her tricks [have sex with men for money] to get the drugs, and I'd get the needles. We met up in the needle exchange or we were planning the night before for the next day. And we kept it like that for a while; it was just a comfortable situation. (Subject 007, HIV and HCV negative)

Some users avoid “dope-sick” periods by securing a steady income while remaining functional members of their community (for further description on activities related to avoiding drug-use-related stigma see Mateu-Gelabert et al. 2005). Some IDUs describe such a balancing act as

being “a functional injector” or, as described by subject 008 (HIV and HCV negative), “getting high successfully”:

I try to get high successfully. Getting high without getting broke, without getting sick, without people telling you what the fuck to do. Getting high and still maintaining, you know, your appearance, taking care of your bills, and you stay with money in your pocket, and you still have all the heroin.

The driving principle behind many activities associated with being a functional drug injector can be summarized in the following formula:

$$\text{Cost of Drug Consumption} < \text{Money Available}$$

In spending less on drugs than their available resources, IDUs can better manage their dependence by avoiding major pitfalls such as losing jobs, engaging in crime, or burdening partners or family members. In order to manage their dependence more safely, some IDUs strategize so the formula’s imbalance remains to their favour by securing a steady supply of money; others, on fixed incomes, will limit their drug consumption (demand) to what their predictable income will support.

On the formula’s supply side, subjects strive to sustain their current sources of income. If legally employed, they try to remain employed. Among our subjects, some held a variety of legal jobs for years while injecting, working as security guards, accountants, sales persons, construction workers, mechanics, etc. Others worked simultaneously various part-time jobs in the underground economy. If the legal job was lost, or for those who never had it, IDUs often resorted to drug selling, sex work (more common among female IDUs) or other illegal activities.

It is worth noting that many IDUs switched from sniffing to injection for economic reasons. In switching to injecting, at least initially, injectors regain control over drug consumption (hence drug expenditures) since injecting is a more effective way to administer the drug, hence reaching a similar high at a lower cost. Resorting to injection improves, at least initially, the drug consumption side of the formula:

I was—that’s the whole thing that I was like, “Damn—1, 2 bags get me straight [alleviate withdrawal] but when I sniff, I’ve got to buy 8, 10 bags to be alright.” [...] And I was like, “Damn, I’m shooting 2 bags and I’m getting double the high I get and I was like yeah. With this [injecting], I could get high forever—I could afford this—20-30 dollars a day.” (Subject 004, HIV and HCV negative)

Despite their efforts, most of our subjects had periods in which they struggled financially to keep up with their drug use. Oftentimes, money became scarce after periods of prolonged use, due to increasing difficulty in keeping or expanding income sources. During these money shortage periods, drug intake was adjusted accordingly. Adjustments are most difficult when there is a sudden interruption of their fixed income (e.g., a break up with a money earning sex partner, lost of employment).

In order to avoid withdrawals in periods when income generation is shrinking, IDUs have little choice but to adjust their drug use to affordable levels—addressing the formula’s demand side. IDUs typically set their drug regimen in accordance to their life circumstances, income, and stage of dependence.

In this titration process, the continual adjustment of their heroin dose, IDUs work as self-prescribing “doctors” devising drug regimens to best fit their available means. An optimal

regimen would take into account (a) amount of disposable income available under current life situation (employment, partnership, housing, family obligations, etc.) and (b) heroin and other drugs needed to get high or, at a very minimum, avoiding drug sickness throughout the day:

Now that she's gone [former IDU sex partner] it [his drug consumption] is only about seven or eight bags. But there was a time that I was doing a bundle [ten bags]. It varies but no less than six. (Subject 007, HCV and HIV negative)

Adjusting drug intake becomes critical when income decreases. IDUs often report setting up minimum drug regimens (referred to by users as "maintenance," playing off the term "methadone maintenance"). This minimum usually requires three daily doses, facilitating IDUs' ability to function throughout the day while avoiding heroin withdrawals. Some IDUs find ways to reach bare minimum maintenance levels with very limited drug supplies. One of our subjects, 019 (HIV negative and HCV positive), a homeless IDU, would buy, dilute, and store one heroin bag in the morning to last him through the day. He had a daily habit of \$20. In the morning, he would buy two bags of drugs (one bag of heroin and one bag of cocaine); he would then mix the drugs with 30 units of water in a cooker. He would inject 10 units of the drug solution and draw the remaining 20 units into the syringe. He would carry the syringe until the next dose around midday. He would put the 20 remaining units into the cooker and draw 10 units for the current dose. After injecting, he would draw the remaining 10 units back into the syringe to save for his night-time dose. This ensures he has equal amounts of the drug mixture (10 units) for each dose.

At times, readjusting one's drug regimen is not a sufficient measure to regain control over dependence (e.g., during drastic money shortages or when drug intake is too high for sustainability). In such periods, IDUs in our sample sought treatment at detoxification or methadone maintenance programs (MMTP) to reduce their tolerance levels. These programs are covered under Medicaid, a state administered program for low-income individuals. Attending these programs reduced the dosage needed to "get straight," allowing users to regain their ability to align their drug consumption with their available resources:

If you see that your tolerance is too high and you know that it's getting to a point where you can't sustain, you know, spending two hundred dollars or a buck eighty. You need to go somewhere else and you go and you get a bottle of meth, you drink that, you know, it will hold you down for two, three days, you know what I'm saying. And as that's coming off now it just dropped. And you can be doing maybe six bags and you be feeling all right. (Subject 026, HIV negative and HCV positive)

MMTP and detoxification centres provide a temporary break from a high or unaffordable required dose. Some IDUs will remain in MMTP for long periods because it provides them with an adequate substitute for heroin consumption. (Others, undoubtedly, use the MMTP as a way to get off heroin completely. Such users, however, would be ineligible for this study.) Many IDUs, after a short interval of methadone use (ranging from one to four months), stop using methadone and return to heroin use. Other IDUs combine the use of methadone with heroin, remaining on MMTP to avoid episodes of withdrawal (therefore also potentially avoiding resorting to crime or other undesirable income-generating measures) while continuing their heroin use with a less frequent intake.

Comparing Uninfected and Infected Participants

Throughout this paper, we have presented the interrelation between opiate withdrawal and its complex relationship with addiction, drug consumption and injection practices, income strategies, and HIV and HCV risk. In order to assess whether these withdrawal strategies could in effect be a determining factor in preventing HCV and HIV, we conducted a systematic

comparison between cases and controls as pertaining to withdrawal related experiences during their years of injecting drugs.

As a result of this comparison we observed that most subjects, independent of serostatus, have developed ways to cope and prevent withdrawal. Uninfected subjects incorporated such behaviours to support their systematic efforts to inject safely (e.g., repeated use of dull needles; sniffing rather than injecting; enrolling in methadone programs). Among infected subjects, two subgroups emerged. The first group, “indiscriminate sharers”, resorted to “needle” sharing when no clean syringes were immediately available. The second group, “non-sharers”, resembled the behaviour of uninfected subjects as they generally engaged in safer drug consumption practices. However, most “non-sharers”, despite their long history of good practices, recalled rare events when they opted to use a used syringe, leading to their HCV infection.

The difference in serostatus between uninfected subjects and infected “non-sharers”, despite similar injection behaviours, may reflect (a) the probabilistic nature of infection and/or (b) biological resistance. In addition, managing withdrawal is only one of several major themes we have identified as influencing injection safety and infection risk (e.g., avoiding situations where other drug users importune you to share drugs; and maintaining social support). Although this comparison does not align perfectly, as some subjects exerted similar withdrawal managing strategies but had different serostatus, it suggests potential hypotheses for further research.

Discussion

Hepatitis C incidence remains high even in contexts where HIV incidence has been drastically reduced (Mateu-Gelabert et al. 2007, Maher et al. 2007, Judd et al. 2005, Des Jarlais et al. 2005). There is a growing consensus on the need to explore additional HCV preventing methods among IDUs (Hagan & Des Jarlais 2000, Hagan et al. 2007, Page-Shafer, Hahn, & Lum 2007). In this paper, we have presented some mechanisms by which avoiding withdrawal could enhance IDUs’ long-term ability to remain uninfected. Our research team has argued that withdrawal avoidance and other non-disease focused goals (e.g., maintaining social support) could provide IDUs with a stronger foundation in their efforts to avoid injection-related diseases (Friedman et al. in press).

In this paper, we have discussed ways in which withdrawal episodes can heighten the likelihood of unsafe practices by undermining IDUs’ ability to inject safely, increasing the likelihood of attending risky settings, number of injection partners, and seeking ad-hoc partners for drug or needle sharing. We have also discussed how some uninfected long-term IDUs have developed “indigenous strategies and tactics” to navigate these difficulties during withdrawal and manage to inject safely. In addition, some IDUs develop strategies to keep withdrawal episodes at a minimum. A key strategy for long-term withdrawal avoidance is regimenting drug consumption in an effort to keep it aligned with available resources. These management strategies might, in turn, help IDUs to prevent HCV or HIV infections.

We believe this paper opens new lines of inquiry for further research. Epidemiological studies should determine whether or not—and how—IDUs who better manage drug “sickness” or who avoid it more successfully are indeed less likely to remain uninfected. We also need to know if and how such use-management and drug “sickness” management strategies help to avoid infections and other pitfalls of dependence (e.g. stigma, social isolation, crime, overdose).

The data presented here indicate that many IDUs exert considerable control over their drug consumption and behaviours, modifying their drug doses with fluctuating incomes—whether by self-conducted adjustments or by entering detoxification or MMTP. This seems to question

current biomedical research indicating that drug use causes long lasting changes on the brain that limit a drug user's ability to make rational choices in terms of their drug behaviour (Leshner 2000, Volkow 2008). Our findings suggest a more complex relation between biological and behavioural aspects of drug use.

Our research also suggests the importance, in efforts to calculate the societal costs of drug dependence (see, e.g., Brand and Price 2000, Godfrey et al. 2000), of taking into account these processes by which users adjust their drug needs. Their success in managing use will reduce economic crime by drugs users and also reduce their medical costs.

Scientific efforts to understand how IDUs assert various degrees of control over their drug use, while still drug dependent, could provide a powerful means of enhancing "Staying Safe" behaviours and practices in addition to preventing the further spread of HIV and other blood-borne diseases. At the policy level, these findings also suggest that supporting IDUs in their efforts to avoid withdrawal and keep their drug dependence at manageable levels might reduce HIV and HCV incidence and other harms to the IDUs and their neighbours. Some of these programs are already in effect and could be expanded (e.g., facilitating low-threshold access to methadone programs and making emergency methadone dosage easily available; creating drop-in detoxification centres open 24 hours). New efforts could be aimed at helping IDUs exert control over their addiction by increasing awareness of the risks associated with drug consumption beyond what they can regularly afford; by helping them maintain legal access to income; and by teaching regimentation methods such as "daily maintenance."

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