Injection Drug Use Among Street Youth: A Dynamic Process

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In 1995, we conducted a one-year cross-sectional anonymous study to estimate HIV prevalence and associated risk factors among street youth in Montréal. A total of 919 participants aged 13 to 25 years were recruited with the collaboration of 20 street youth agencies. An HIV prevalence rate of 1.85% (95% CI 1.12-2.89) was found, which was 3.7 times higher than the rate estimated for the general Montréal population.[1,2] Injection drug use was one of the risk factors associated with infection. In fact, 36% of street youth had ever injected drugs and 23% had injected in the previous six months. These rates represent the highest rates of injection drug use ever reported among street youth in the literature.[3-6] These disturbing findings prompted us to develop a prospective cohort study in which we monitor the evolution of drug-related behaviours among street youth.

METHODS

Recruitment in the cohort study started in July 1995. All youth between 14 and 25 years of age, French or English speaking who intended to stay around Montréal in the following year and who met one of the two criteria defined hereafter, were eligible. They had to either have been without a place to sleep more than once in the previous year ***or*** have regularly used the services of one of the Montréal street youth agencies in the previous year. All participants signed a consent form in which they authorized the personnel of different agencies and institutions to disclose information on them which would help the research team find them again.

At enrollment and then every six months thereafter, each subject completes a 45-minute interview and provides an oral fluid sample collected with OraSure™ for an HIV antibody test. A compensation fee is given at the end of the visit. Each interview addresses sexual and drug use behaviours that street youth may have had in the previous six months. In addition, lifetime variables were obtained at baseline.

We report here some very disquieting results on injection drug use. For those youth who had injected drugs at least once at baseline (T0) (defined as injection drug users or IDU), we calculated proportions of street youth with improving, maintaining and deteriorating behaviours between interviews. The rate of initiation to injection was assessed by calculating the incidence rate of injecting among street youth who had never injected at T0.

RESULTS

By January 1997, 459 youth had completed their baseline (T0) and second (T1) interviews for a retention rate of 89% over a 6.9-month mean observation period (range: 4.3-14.4 months) representing a total of 265.8 person-years (p-y) of follow-up. Among the 182 IDU at T0 (40% of the cohort), 117 had injected during the six months prior to interview (see Table I). Of the 117, 15 (13%) had stopped injecting at T1, while the remaining 102 (87%)

TABLE I
Injection at T0 and T1: Intra-individual Changes

		Behaviours at T1		
Behaviours at T0	n (%)	Maintained n (%)	Amelioration n (%)	Deterioration n (%)
Never injected	277 (60)	258 (93)	—	19 (7)
Has not injected recently	65 (14)	43 (66)	—	22 (34)
Has injected recently	117 (26)	102 (87)	15 (13)	—
All subjects	459 (100)	403 (88)	15 (3)	41 (9)

TABLE II
Most Frequently Injected Drug in the Previous Six Months Among the Stable Injectors: Intra-individual Changes (N=99)*

		Behaviours at T1		
Behaviours at T0	n (%)	Cocaine n (%)	Heroin n (%)	Other n (%)
Cocaine	37 (37)	26 (70)	10 (27)	1 (3)
Heroin	56 (57)	11 (20)	45 (80)	—
Other	6 (6)	4 (67)	2 (33)	—
All subjects	99 (100)	41 (41)	57 (58)	1 (1)

* Missing data for three subjects

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continued doing so. Among the 65 IDU who had not injected in the six months prior to T0, 43 (66%) were still not injecting at T1 but 22 (34%) had had a relapse. Furthermore, of the 277 youth who had never injected at T0, 19 began injecting between their two interviews. This represents an incidence rate of new injection of 12.3 per 100 p-y (CI 95% 7.4-19.2).

More than half of the 19 new injectors (58%) had already borrowed used needles by the time we interviewed them and 42% had also lent or given their own used needles. Four of these new injectors (21%) had already injected more than 100 times while seven (37%) had only injected 5 times or less. Cocaine had been injected by 74% of the new injectors and heroin by 53% of them.

Concerning the 102 youth who had injected in the six months prior to T0 and continued doing so ("stable injectors"), 18% had never shared needles at T1 while 10% had started to do so between T0 and T1. As shown in Table II, of these "stable injectors" at T0, 37 (37%) reported cocaine as the drug most frequently injected during the prior six months, 56 (57%) reported that it was heroin and 6 (6%) reported other drugs (mainly speedballs and PCP). At T1, we found a slight increase in both cocaine (41%) and heroin (58%) use apparently due to a shift from other drugs (which decreased to 1%). On an individual level, however, there was much more variation. Indeed, a total of 28 youth (28%) had changed their choice of drug most frequently injected between the two interviews.

DISCUSSION

The high rate of initiation to injection as well as the high rate of relapse show that injection patterns are unstable among youth. This is also true concerning the drug most frequently injected. The fact that more than a quarter of "stable" users shifted from one drug to another between T0 and T1 underlines the risk, when planning detoxification services, of inappropriately labelling young IDU as cocaine or heroin addicts. The reasons for this shift are still unknown. Availability, peer pressure or individual preferences are possible factors.

Needle sharing is common among young IDU and it seems to begin soon after initiation. This behaviour occurs in a city where syringes are easily available through five needle exchange programmes and numerous pharmacies.

A better understanding of the reasons why young IDU change the drug they most frequently inject as well as why they share injection material is needed in order to make preventive efforts more effective.

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measure like particulate matter. A complete review of the vast literature on this topic is not possible within the context of this response. We agree that our risk estimates are somewhat higher than those reported for ozone,[2] nitrogen dioxide,[2] sulphur dioxide,[3] and carbon monoxide.[4] However, these studies have not considered all these pollutants in combination and thus the reported size of their effects were not as large as those given in our recent study.

Our risk estimates were based on multiple day averages of pollutant concentrations which were shown to be a greater risk factor for mortality than single day measures. This finding implies that the pollution effect is distributed over several days. Some deaths occur on the day of high pollution exposure, other deaths are on the day after, and some additional deaths are observed two days after exposure. We believe that this distributed effect model is a more biologically plausible scenario than a single day effect model.

Granville et al. also suggest that we have ignored the 'massive amount of traditional epidemiology, human clinical and animal toxicology research that finds no mortality resulting from exposures to the four gases at low levels.' Traditional epidemiology and human clinical studies are not necessarily the only appropriate means of assessing effects on mortality. The new methodology of utilizing administrative health and air pollution information with innovative methods of robust statistical analyses of time series data have allowed us to detect adverse health effects at lower concentrations than previously thought possible. Statistical approaches to the analysis of parallel time series of health and environmental information have been well documented and shown to be robust against the type of statistical method employed.[5]

We reconfirm our 'disquieting' conclusion that the four gases can explain all the association with mortality in major urban locales with no additional impact of particulate matter. This is not to say that particulate matter is not a predictor of mortality, a conclusion supported by a host of studies.[6] Particulate matter itself is a complex mixture of organic and inorganic matter, whose composition can vary by location and time. Much of the fine particulate matter in urban environments is generated either by the same sources of pollution as the gases, industrial activity and transportation, or from secondary formation in the atmosphere from primary gaseous emissions. Concentrations of the gases and particulate matter are correlated in time and as such, not all these variables are required to explain the total effect of the pollution mixture on health.

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