



Early stages of the HIV epidemic among injecting drug users: Lessons to be learned

Tanvir Ahmed^{1*}, Donald Stewart¹

ABSTRACT

Injecting drug use driving the HIV epidemic is currently a major global public health concern. However, the early epidemic among injecting drug users (IDUs), more than three decades ago, was only concentrated in few places. The HIV epidemic among the IDUs in New York, USA; Edinburgh, Scotland, UK; and northern Italy provides examples of where the recorded prevalence exceeded 50% within a very short period of time. This brief review highlights historical perspectives of HIV transmission risk among IDUs during the early stages of the epidemic. Salient features and related experiences during this period might provide valuable insights for current HIV prevention. Our overview of the selected locations reemphasizes the importance of early prevention. The discussion also introduces to new researchers the early situation associated with the HIV epidemic in IDUs and highlights some crucial components need to be included during current HIV prevention activities.

Keywords: HIV, AIDS, Injecting drug users, New York, Edinburgh, Italy, Prevention

INTRODUCTION

The progress of the HIV pandemic was never envisaged at the initial stage to develop as it appears today²⁷. An injecting drug use driven HIV epidemic has currently become a major pressing public health issue. The epidemic among injecting drug users (IDUs) is of major concern because, over the last three decades, it has affected a number of nations and exacerbated the existing epidemic with consequences not only for human health, but also the overall development process. Apart from sub-Saharan Africa, IDUs account for around 30% of HIV transmission, affecting both resource-rich and resource-poor countries³¹.

The introduction of HIV among IDUs, possibly by the gay/bisexual population, began around the mid-1970s³². Since its introduction, HIV infection among IDUs provides a clear example of the association between widespread risky practices (such as needle and syringe sharing) and high level disease prevalence (HIV infection)²³. Within a few years, the HIV epidemic among the IDU population soared as

a result of frequent risk taking behaviors^{2,22}. The early epidemic in IDUs was concentrated in very few countries during first half of the 1980's. Examples include evidence highlighting the injecting drug use driven HIV epidemic in New York City (NYC), USA; Edinburgh, Scotland, UK and selected northern parts of Italy (Milan) where high HIV prevalence was found among IDUs^{10,16}. These three cities are regarded as example cases of early epidemics where the prevalence crossed well over 50% mark within a very short time period. These cities faced a rapid HIV spread among IDUs during the early 1980s, especially between 1981 and 1984^{2,16,22}.

Researchers at that time when information was scarce and anecdotal acted promptly and conducted a number of studies to investigate the prevalence of disease (HIV and AIDS) and examine the associated risk factors. Results from their efforts provided crucial insights to develop prevention programs. These findings later supported initiatives to prevent drug injection and

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¹Griffith University
School of Medicine
Public Health and Health Promotion
South Bank Campus
Griffith Graduate Centre
226 Grey Street, South Brisbane
QLD 4101, Queensland, Australia

*Corresponding Author
South Bank Campus
Griffith Graduate Centre
Room S07_4.02, 226 Grey Street
South Brisbane, QLD 4101
Queensland, Australia
Cell: +61469115639
Fax: +61 7 3 7353 282
tanvir.ahmed@griffithuni.edu.au

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HIV infection worldwide^{12,30,40}. The lessons of the early epidemic are still significant in relation to HIV prevention among IDUs and it is important for new researchers to understand these early epidemics. Our overview aims to discuss in brief the key situations associated with these epidemics, draw significant lessons and assess historical achievements to control the HIV epidemic among IDUs.

MATERIALS AND METHODS

This review is based on published international literature associated with the HIV epidemics among the IDUs in NYC, Edinburgh and northern Italy. The literature was sourced from a university library database using PubMed, ProQuest, and Science Direct, with relevant key words in different combinations (early HIV/AIDS epidemics, New York and IDUs, Edinburgh and IDUs, Italy and IDUs, Milan and IDUs, historical epidemics with IDUs, risk factors and IDUs in New York/ Edinburgh/ Italy/ northern Italy/ Milan). Research articles identified were reviewed in terms of: epidemics in these three locations; HIV infection; and associated risk factors. Articles showing HIV infection data and associated risk factors were prioritised. Thirty-five peer reviewed articles were selected to prepare this overview. Of these, 11 articles related to the epidemic in IDUs in Italy; 12 related to cases in NYC, USA; and 12 related to Edinburgh, UK. A manual check of reference lists supplemented the literature selection process, since most articles were published during early 1980s and 1990s.

RESULTS

The key results represent first half of 1980s, the years 1981 to 1984 during the early stages of the epidemic among IDUs in the three selected case countries. It primarily highlights level of HIV prevalence, risk factors, initial prevention programs and epidemic progression.

(i) New York City, USA

The injecting drug use driven HIV epidemic in NYC is the largest HIV epidemic in IDUs in the world^{13,26}. The infection was introduced to this population in the late 1970s and rapid spread occurred through the early to the mid-1980s^{11,12}. The history of the IDU epidemic in NYC, over time, has been well documented and provides a basis for learning about the epidemic evolution within this subpopulation¹⁹. The main risk factors associated

with HIV infection among IDUs in NYC are injecting in shooting galleries where widespread sharing occurs, and frequency of injection³⁰. The first needle syringe program commenced in NYC in 1988³⁹. Detailed epidemiological research with IDUs in NYC generated valuable insights in analysing the course of the epidemic with necessary prevention strategies in each of the epidemic stage^{9,11,19}. Commonly, there are three stages of HIV epidemic with IDUs:

- (i) introduction with early spread
- (ii) rapid spread; and finally
- (iii) stability in prevalence¹¹

Detailed analysis of prevention efforts from the research among IDUs in NYC played pivotal role in stabilising the epidemic¹⁴. In NYC the prevalence was higher (around 50%) during the stability phase of the epidemic¹⁵. The injection drug use driven HIV epidemic among IDUs in NYC began to decline when the major injection and sexual risk practices reduced from 1990-1997⁸. An advanced analysis showed a further reduction in HIV incidence after 2000, which is associated with large-scale prevention programs among the IDUs¹⁷. Amongst other factors, increased non-use of any previously used needles/syringes and simultaneously decreased distribution of used needle/syringe within IDU network members is exemplary¹⁴.

Despite successive investigations with IDUs in NYC which helped generate an important body of scientific knowledge relating to the HIV prevention, the city did not benefit in a major way from this advantage and failed to control the epidemic at an early stage⁵³. An important lesson which can be drawn from the NYC epidemic, as summarised is the need to implement large-scale comprehensive programs which can reduce the transmission and gradually get control over the epidemic (as low as 1/100 incidence)⁹.

(ii) Edinburgh, Scotland, UK

The Edinburgh epidemic appears to have developed among IDUs between 1980 and 1983 and initial research indicated prevalence among the IDUs reached more than 50% within a year⁴⁰. Once the epidemic was established, a follow-up study documented widespread prevalence and recorded the peak prevalence level, of around 65% among Edinburgh IDUs^{4,45}. The frequency of needle/syringe



sharing was found to be strongly correlated with sero-positivity, which confirms it as the most likely reason for the rapid spread of the virus⁴⁰. At that time, the prevalence among IDUs outside Edinburgh was low⁵². The introduction of the virus among the local IDUs was not properly identified; however a reconstruction of the Edinburgh cohort is available using stored serum which suggests that multiple overlapping epidemics of viral hepatitis and HIV may have occurred⁵. A steady rise in the number of drug injectors was observed in the late 1980s in Edinburgh⁴⁶. A number of programs were formally initiated in the mid-1980s, incorporating a harm reduction approach, which helped control the epidemic gradually by the early 1990s²⁹. Separate clinics with special services including testing and counselling were established for IDUs and proved effective in the early stage of the injecting drug use driven HIV epidemic among IDUs in Edinburgh³.

The prevalence level dropped to around 20% by the mid-1990s among intravenous users in Edinburgh⁷, although it remained higher in comparison to other cities in the UK^{41,42}. A study of intravenous users tested HIV positive during the early 1990s found that positive status was associated with age, injecting during the period of rapid transmission (1982-1984), and imprisonment. This was despite only a quarter of them having reported using previously used needles or syringes⁷. Mixing with sexual partners and unsafe sexual practice was prevalent and might have contributed for high prevalence. Consequently, heterosexual transmission also appeared later as a cause of concern⁴⁰.

(iii) Northern Italy

HIV among Italian IDUs was first identified in Milan in 1979²⁸ and soon after introduction, a rapid spread occurred between 1981 and 1984^{1,35,44}. Prevalence reached a peak of around 60% in 1985-1986²⁰. At that time, parts of Italy were experiencing the worst form of injecting drug use driven HIV epidemic in Europe^{18,20,21}. A number of programs were initiated to control the HIV epidemic situation focusing on hospitals and communities and the HIV prevalence among IDUs dropped to 49% in the late 1980s³⁶. Gradually, the annual sero-prevalence rate decreased from 6.1% in 1987 to 1.6% in 1990⁴⁶ and the injecting drug use driven HIV epidemic in the northern Italy appeared to be in a stable stage

through 1993-1999 with reduced HIV incidence when compared with the epidemiological stage among IDUs in NYC⁴³. The epidemic also reduced in other parts of Italy (Bari) in the same period^{33,48}.

In terms of the risk factors, the chances of becoming HIV infected was six times higher among intravenous users who often shared syringes (more than 50% of the time) than among those who did not share³⁷. In addition, youth and short initiation periods were also associated with HIV infection among Italian IDUs in the early stages of the epidemic^{37,43}. The diffusion of HIV infection occurred simultaneously with rising HIV prevalence among Italian IDUs^{46,43}. The most striking feature observed from a large prospective cohort of Italian IDUs was the increasing infection among female IDUs because they were more likely to have male IDUs as partners and being involved in sex work^{33,43,48}. Growing infection among female IDUs suggests an enhanced prevention need, with a special focus on heterosexual transmission⁴³.

DISCUSSION

These three selected case studies above reveal cities with similar epidemic features, in terms of concurrent period, rapid spread, common risk factors and as well as transition of epidemic stages^{1,11,14,35,43,47}. A review of the early research perspectives provides a strong indication that IDUs gradually become aware about HIV/AIDS related risk factors and can reduce their injection-related risk behaviors. However, the process of self-initiated risk reduction works slowly at a later stage of the epidemic. Therefore, the lessons to be learned stress early prevention activities are essential to help prevent the spread of the infection and control the epidemic⁴⁷.

Almost all the factors highlighted during the early stage of the epidemic still significantly influence the spread of HIV infection, in various combinations. Factors including injecting in a shooting gallery²⁴; sharing behaviour (needle, syringe, drug solution, common water container, cotton wool, rinse water and other injection paraphernalia)^{38,50}; age^{34,49}; rapid transition to injectable drugs (switching behaviors); heterosexual transmission²⁵; and female injectors⁵¹ all need to be addressed from the beginning of the epidemic among IDUs. Knowledge of these historical risk factors is significant for program planners and should be considered for



inclusion in current HIV prevention programs. Prevention activities from the early stages of the HIV epidemic that address, for example, distributing sterile needles/syringes and other injection paraphernalia, providing outreach services by peers/health workers to different gathering places of IDUs including shooting galleries, integrating drug injecting and sexual risk messages for awareness campaigns, targeting young and new IDUs separately who remain out of contact etc. at early stage of epidemic, can also become protective factors to control the HIV epidemic at later stages.

This historical perspective has identified that the factors which facilitate the extremely rapid spread of the HIV infection include:

- (i) lack of awareness of HIV/AIDS as a local threat,
- (ii) legal restrictions on availability and use of sterile needles, syringes and other injection equipment, and
- (iii) a mechanism for rapid and efficient mix-up within the IDU community⁶.

Furthermore, the review has highlighted the importance of scientific research since the early stage of HIV epidemic among IDUs. Findings from these early research provided crucial evidence relating behavioural risk factors which supported the development of prevention program greatly in line with the scale of the epidemic. Moreover, monitoring and evaluation of existing prevention activities helped the program planners to re-design intervention. The lessons from the early stages of HIV epidemic are very encouraging and thus more research can be undertaken to highlight other aspects such as integration of harm reduction components which gradually helped strengthen HIV prevention efforts. Another important area of future research would include policy formulation and evolvement of favourable policies during the period of epidemic progression. Future research illustrating the involvement of different actors and the background planning undertaken to develop relevant policies in early stages of the epidemic might provide insights for program planners of today to develop favourable policies for countries which experience similar scenario. Consequently, the learnings from the early stages of HIV epidemic in IDUs may become instrumental and could be adapted to guide the current prevention program in

different combination for controlling injection drug use driven HIV epidemic among the IDUs.

This brief review has a number of limitations. First, it refers to only three case studies where HIV prevalence reached more than 50% shortly after the introduction of the infection. Undoubtedly, there are other places that developed high prevalence immediately after the epidemic commenced. Experiences from these places might generate interesting findings and deserve similar review. Second, it only focuses on selected aspects such as

- (i) risk factors
- (ii) epidemic progression
- (iii) initial prevention programs.

There may well be other important historical aspects relating clinical, behavioural and social aspects of the IDU HIV nexus which are not covered by this review. Third, it only includes literature which reported HIV infection data and associated risk factors. There may well be other literature showing behavioural implications, but which does not report HIV infection and thus is not covered in this review. Despite these limitations, this brief historical perspective highlights evidence associated with IDUs and HIV risks which can be useful for program planners to gain knowledge about earlier epidemics, as well as to emphasize the need for early prevention measures.

CONCLUSIONS

A historical perspective of the HIV epidemic in relation to IDUs is crucial to realise the importance of early intervention to address a set of universal HIV risk behaviors, whatever the stage of the epidemic. The need for strong early prevention becomes clear from this historical overview and can be weighed against the human and financial difficulties of implementing a large-scale program during the mature stage of the epidemic. There are important lessons to be learned from the early history of the epidemic and these should be incorporated into basic risk reduction messages in current prevention activities. This would ease the struggle for HIV prevention at the latter stage of HIV epidemic.



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