

Mitigating the risk of HIV infection with opioid substitution treatment

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Introduction

Injecting drug use is a major risk factor for the acquisition and transmission of the human immunodeficiency virus (HIV) and accounts for approximately 5 to 10% of all cases of HIV infection in the world. People who inject drugs are vulnerable to infection with HIV and other blood-borne viruses, predominantly as a result of the collective use of injecting equipment and, to a lesser extent, of unprotected sexual behaviour.¹ HIV infection results from one of every 125 injections with an HIV-contaminated syringe, one of every 40 to 400 acts of receptive anal intercourse and one of every 2000 to 3000 acts of heterosexual intercourse.²

People who inject drugs are not only at risk of HIV infection themselves. Those who are HIV-infected can transmit the virus to the general population through sexual contact or, if pregnant, they can infect their unborn children.

Since contaminated syringes and needles transmit HIV very efficiently, the virus can spread rapidly among people who inject drugs. The incidence of HIV infection has fallen or remains low in this group in Australasia, North America and parts of western Europe, yet despite this, injecting drug use has driven recent outbreaks of HIV infection in many countries. The incidence of HIV infection is increasing in parts of the Russian Federation, eastern Europe and Asia, where as many as 40% of the people who inject drugs may be infected in some sites.

HIV infection is associated with high rates of morbidity and premature mortality and its treatment and care are expensive. The introduction of antiretroviral combination therapy has improved outcomes for people infected with HIV, but access to antiretrovirals is limited, particularly in low- and middle-income countries.³ Consequently, preventing HIV infections remains a vitally important goal.

Needle and syringe programmes can reduce the incidence of HIV infection by increasing access to uncontaminated injecting equipment.² Such programmes also facilitate reaching out to people who inject drugs, who are a largely hidden population. It is the combined use of antiretroviral therapy, needle and syringe programmes and opioid substitution treatment that is likely to yield the greatest benefits in terms of the control of HIV² and hepatitis C among people who inject drugs.⁴

Substitution treatment consists of prescribing a drug whose action is similar to that of the drug of dependence but whose use is less risky. The pharmacological agents most commonly used for substitution treatment in cases of opioid dependence are methadone syrup and buprenorphine, which is administered as a sublingual tablet or film.⁵ Substitution treatment entails the following:

- replacement of injected, illicit drugs with non-injected medications;
- use of longer-acting medications to interrupt the cycle of intoxication and withdrawal, an important source of social disruption;
- individually-adjusted, regular dosing to prevent withdrawal and reduce the effect of each opioid dose, which in turn helps to reduce illicit opioid use;
- retention of dependent opioid users in treatment, which facilitates psychosocial interventions;
- treatment delivery in a community setting to allow family and community roles and connections to be maintained; and
- enabling opioid dependent drug users to stabilize in health and social terms before addressing the physical dimension of dependence.⁵

Methadone and buprenorphine are opioids. As such, both drugs can lead to overdose, particularly methadone. Overall, however, dependent opioid users who receive substitution treatment

have less than half the risk of dying observed in those who do not receive it.⁶

Three aspects warrant consideration in connection with the role of opioid substitution treatment in the prevention and management of HIV infection: (i) acquisition of HIV infection by people who inject drugs; (ii) behaviours in this group that increase the risk of transmitting HIV infection; and (iii) the management of HIV-positive (HIV+) injecting drug users. This article considers each of these aspects in turn.

Acquisition of HIV infection

The effect of opioid substitution treatment on HIV transmission among people who inject drugs was recently assessed through a systematic review of observational studies (12 published, three with unpublished data).⁷ In nine of these studies, involving 819 incident HIV infections over 23 608 person-years of follow-up, opioid substitution treatment was associated with a 54% reduction in the risk of HIV infection among people who inject drugs (relative risk, RR: 0.46; 95% confidence interval, CI: 0.32–0.67; $P < 0.0001$). Some heterogeneity among studies was noted (I^2 : 60%; χ^2 20.12; $P = 0.010$) and attributed in part to geographic region, site of recruitment and participant characteristics. Furthermore, four studies showed that methadone used for detoxification alone was associated with an increased risk of HIV transmission (RR: 1.54; 95% CI: 1.05–2.26; $P = 0.026$), which suggests that it is opioid substitution treatment provided as maintenance therapy, and not just any prescription of methadone, that protects against HIV infection among people who inject drugs.

Risky behaviours

According to a systematic review,⁸ oral substitution treatment of opioid dependence with methadone or buprenorphine is associated with reductions in

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illicit opioid use, injecting drug use and sharing of injecting equipment. It is also associated with reductions in the proportion of users of injected drugs who report multiple sex partners or exchanges of sex for drugs or money, but has little effect on condom use. Due to methodological limitations in this review, the extent to which risk behaviours were reduced was not calculated, but the studies reviewed consistently reported reductions in risk behaviours. The reduction in RR reported by individual studies ranged from 32 to 69% for illicit opioid use, from 20 to 60% for injecting drug use and from 25 to 86% for the sharing of injecting equipment.

Management of HIV+ injecting drug users

A third systematic review⁹ sought to identify the factors associated with non-adherence to HIV treatment. This review considered 41 studies involving 15 194 patients, 76.5% of whom were HIV+ users of injected drugs. Active substance use, depression and low social support were found to be associated with poor adherence to antiretroviral therapy, while higher adherence was found in patients receiving care in structured settings (e.g. directly observed therapy) and/or treatment for drug addiction, especially substitution treatment. The more stable lifestyle and daily routine associated with opioid substitution treatment were felt to contribute to the greater adherence to antiretroviral therapy noted in HIV+ users of injected drugs who receive substitution treatment.

Other infections

Substance abuse and HIV infection put people at high risk of contracting tuberculosis. In a randomized controlled trial, substitution treatment with methadone was found to be associated with higher rates of completion of drug therapy for tuberculosis than directly-observed treatment, whether or not substance abuse counselling was provided.¹⁰ Substitution treatment also provides an opportunity to vaccinate drug users against hepatitis B and to screen for and treat hepatitis C and a range of physical and psychiatric conditions that are more prevalent among illicit drug users than in the general population.

Applicability to developing countries

The majority of studies identified by the systematic reviews discussed in this article were undertaken in North America or western Europe. Very few studies have been undertaken in low- or middle-income countries. Some data have been provided by the WHO Collaborative Study on Substitution Therapy of Opioid Dependence and HIV/AIDS, which was undertaken in Australia, China, Indonesia, the Islamic Republic of Iran, Lithuania, Poland, Thailand and Ukraine¹¹ at a time when many of these countries had only recently introduced substitution treatment. The finding that such treatment was associated with reductions in the use of heroin and other opiates and in injecting risk behaviour suggests that substitution treatment is effective across a range of cultural and economic con-

texts. Although buprenorphine is more expensive than methadone, substitution treatment with methadone can be provided cheaply in community settings and is therefore a feasible option for low- and middle-income countries. The data available so far support its effectiveness in reducing risk behaviours.¹¹

Conclusion

The use of opioid substitution treatment in the prevention of HIV infection is supported by strong evidence. There is also good evidence that opioid substitution treatment can prevent the acquisition of HIV by people who inject drugs, modify behaviours among these people that increase the risk of transmitting HIV and other infections, and enhance the effectiveness of treatment for HIV infection and tuberculosis in this group. However, some gaps in the evidence remain. Most of the data collected so far are on the use of methadone rather than buprenorphine. There is also a need for more data from low- and middle-income countries, particularly those with a high prevalence of HIV infection among people who inject drugs. Nonetheless, the evidence clearly shows that the provision of substitution treatment for opioid dependence in countries where HIV infection and injecting drug use are emerging problems, as well as in countries with established populations who inject drugs, would help to prevent the spread of HIV among members of this group and between them and the general population. ■

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