Effectiveness of drug dependence treatment in HIV prevention

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Abstract

This review considers the effectiveness of drug dependence treatment in preventing HIV transmission among injecting drug users (IDUs). Substitution programmes using agonist pharmacotherapy (e.g. methadone and buprenorphine maintenance treatment) are available only for drug users who are primarily opioid dependent. There are over half a million people in receipt of methadone maintenance treatment (MMT) and it is estimated that this number will double in the coming decade. There is evidence that MMT is associated with a significant decrease in injecting drug use and sharing of injecting equipment. Data on sex-related risk behaviour change are limited, but suggest that MMT is associated with a lower incidence of multiple sex partners or exchanges of sex for drugs or money, but no change, or only small decreases, in unprotected sex. Studies of seroconversion, which is the toughest and most robust standard for assessing the role of MMT in HIV prevention, suggest that the reductions in risk behaviours do translate into actual reductions in cases of HIV infection. While the data on HIV risk behaviour are limited, there is strong evidence that substitution treatment with either methadone or buprenorphine suppresses illicit opioid use. There is also evidence that substitution treatment for HIV-positive IDUs is associated with better compliance with anti-retroviral treatment and improved health outcomes. The only antagonist being used for opioid dependence relapse prevention treatment is naltrexone. There is currently insufficient evidence to draw firm conclusions as to its effectiveness. Behavioural interventions add to the effectiveness of substitution treatment, while the effectiveness of different types of psychological therapy alone has been found to be variable. There have been few comparative studies of abstinence-based treatment, however, available evidence indicates good outcomes for those who remain in treatment for three months or more. All countries with a population of IDUs should aim to develop a comprehensive range of treatments, including substitution treatment, as a critical component of HIV prevention.

Keywords: HIV; Prevention; Treatment; Methadone; Buprenorphine; Risk reduction; Injection drug use

Introduction

Injecting drug users (IDUs) are vulnerable to infection with HIV and other blood-borne viruses as a result of collective use of injecting equipment and drug solutions, as well as through sexual behaviour. Since sharing or use of contaminated injecting equipment and drug preparations is a very efficient mode of HIV transmission, HIV can spread rapidly among IDUs (Des Jarlais, Friedman, Woods, & Milliken, 1992; Stimson, 1995). Unprotected sex between HIV-positive IDUs and other people can result in further HIV transmission both inside and outside of the IDU population. A recent joint review by international organisations succinctly summarises the benefits of substitution treatment for policy-makers and professionals globally (Joint WHO/UNAIDS/UNODC, 2003).

Injecting drug use-related behaviour is a significant factor contributing to HIV transmission, even though IDUs...
constitute only a very small proportion of the population. Globally, between 5 and 10% of HIV infections result from the sharing of contaminated injecting equipment and drug preparations during injecting drug use, while rates of injecting drug use-related sexual transmission are unknown.

The aim of this review is to consider the effectiveness of drug dependence treatment in reducing HIV transmission among IDUs. The review considers all types of drugs that are commonly injected (e.g. heroin, cocaine, amphetamines and buprenorphine) and all forms of drug treatment (pharmacotherapy, abstinence-based and behavioural interventions either alone or in combination with pharmacotherapy). The evidence of the effectiveness of drug dependence treatment is summarised with particular emphasis on injecting and injecting-related risk reduction interventions.

Review methodology

The most direct means for assessing HIV transmission prevention would be to consider seroprevalence amongst IDUs in and out of treatment, and rates of seroconversion. However, such studies are few in number and are potentially confounded by factors such as differences in the background HIV prevalence in the community from which study participants are drawn, as well as additional factors such as access to drug treatment, preventive education and clean injecting equipment, all of which will influence exposure to HIV, thereby influencing seroconversion and seroconversion rates.

The potential impact of drug dependence treatment on HIV prevention is via: reduced injecting drug use; reduced sharing of injecting equipment and drug preparations; reduced HIV-related sexual risk behaviours; and opportunities for HIV education, counseling and medical care (Sorensen & Copeland, 2000).

This review places emphasis on the effect of treatment on risk behaviours associated with a high risk of HIV transmission, but gives some consideration to rates of seroconversion.

Agonist pharmacotherapy programmes

Agonist pharmacotherapy programmes entail the prescription of a drug with similar action to the drug(s) used by the drug user (an “agonist” in pharmacological terms) but with a lower degree of risk. Agonist pharmacotherapy programmes are available only for drug users who are primarily opioid dependent. Although some researchers and commentators have called for the development of agonist pharmacotherapies for cocaine and amphetamine users, and some small-scale programmes have been initiated, currently such approaches are not widely available (Shearer & Gowing, 2004).

Agonist pharmacotherapy programmes are of two general types: detoxification programmes, in which doses of the agonist will be reduced over a period of time until a drug-free state has been reached; and substitution or maintenance programmes in which higher doses of the agonist are provided for longer time periods (6 months or more).

The value of substitution treatment lies in the opportunity that it provides dependent drug users to reduce their exposure to risk behaviours and stabilise themselves in health and social terms before having to face the discomfort of drug withdrawal syndrome and adapting to a drug-free state.

The agonist agent that has been most widely applied and researched for treatment of opioid dependence is methadone. Typically administered orally as syrup, a single dose of methadone in most (but not all) people will prevent withdrawal symptoms for 24 h. Hence, methadone decreases the frequency and intensity of the cycle of intoxication and withdrawal. In methadone maintenance treatment (MMT), doses of 60 mg/day or more have been identified as being most effective in terms of retention in treatment and reductions in illicit drug use and criminal behaviour (Ward, Matick, & Hall, 1998). However, lower doses are typically used in detoxification regimens (Gowing, Ali, & White, 2000).

A drug that is increasingly being used as an alternative to methadone is buprenorphine. Buprenorphine is a partial opioid agonist but has enough morphine-like action to substitute for heroin, prevent withdrawal symptoms and reduce craving. Furthermore, with increased doses the degree of respiratory depression and other opioid effects reach a plateau, consequently buprenorphine has less overdose risk associated with it. The prolonged duration of action of buprenorphine, enables it to be administered less frequently (on alternate days). Buprenorphine is not well absorbed if taken orally and is usually administered sub-lingually. A combination product containing buprenorphine and naloxone (an opioid antagonist that is poorly absorbed when taken sublingually or orally, but precipitates an opioid withdrawal when injected) has been developed to provide additional safeguards against diversion and the use of buprenorphine by injection. This is expected to enable increased provision of substitution treatment for opioid dependence in primary health care settings, particularly in the United States (Johnson, Strain, & Amass, 2003).

Gowing, Farrell, Bornemann, and Ali (2004) have recently completed a systematic review of studies in Europe and the United States relating the incidence of HIV risk behaviours or HIV infection to oral substitution treatment for opioid dependence. In total, 28 studies were included in this review. All involved MMT and, in the majority of the studies, treatment was provided through specialist drug dependence treatment programmes. It remains unclear to what extent the conclusions of the review will apply to other agonist pharmacotherapies, such as buprenorphine maintenance treatment (BMT), and to other settings, such as office-based treatment. To date these studies have been mainly conducted in Europe and the United States. There is now an urgent need to conduct similar studies in a variety of cultural and economic settings so as to ascertain whether the findings are replicable in all settings.

Gowing et al. (2004) found that substitution treatment is associated with a significant decrease in the proportion...
of participants reporting injecting drug use, and in the frequency of injection. Due to the diversity of study designs and the means of assessing and reporting injecting drug use, the authors were unable to make a quantitative estimate of the extent of the decrease. Gowing and colleagues also concluded that substitution treatment is usually associated with a significant decrease in the sharing of injecting equipment, but were unable to determine whether this was due to a reduction in injecting drug use.

From studies included in the review, data on sex-related risk behaviours were limited but were suggestive of substitution treatment being associated with a lower incidence of multiple sex partners or exchanges of sex for drugs or money. At the same time the data suggested no change, or only small decreases, in unprotected sex among heterosexual regular partners.

Gowing et al. (2004) identified four studies that reported rates of HIV seroconversion related to substitution treatment. While differing in their methods of assessing and reporting data, all four studies indicated lower rates of seroconversion associated with substitution treatment. This suggests that the reductions in risk behaviours do translate into actual reductions in cases of HIV infection.

At present, it is not possible to compare methadone with other pharmacotherapies or with other treatment approaches in terms of capacity to reduce HIV risk behaviours. Most controlled trials making such comparisons rely on urine screening (drug use) and retention in treatment as primary outcome measures with HIV risk behaviours not considered in detail. However, if it is assumed that drug use is an indicator of the likelihood of risk behaviours, then this outcome provides some indication of the probable effect on HIV risk behaviours.

Methadone does not completely stop heroin use amongst clients but it does substantially reduce use. Kreek (2000) states that MMT with adequate doses of medication and access to counselling, medical and psychiatric care as needed, leads to voluntary, 1-year retention of 60–80% of people with reduction of daily illicit opioid use from 100% of persons entering treatment to less than 2% of persons within 1 year. From a review of research literature, Ward et al. (1998) found that methadone dose showed a positive linear dose–response relationship with retention in treatment and a negative linear relationship with heroin use.

Mattick, Breen, Kimber, and Davoli (2002), from a systematic review, concluded that methadone appeared statistically significantly more effective than non-pharmacological approaches in retaining patients in treatment (RR = 3.05, 95% CI: 1.75–5.35) and in the suppression of heroin use (RR = 0.32, 95% CI: 0.23–0.44). Data from observational studies also indicate that MMT produces better outcomes than detoxification alone or drug-free treatment in terms of heroin use, criminal behaviour and sexual risk behaviour (Hall, Ward, & Mattick, 1998). The Treatment Outcomes Prospective Study (TOPS) found that retention in treatment at three months was highest for MMT (65%) followed by therapeutic communities (44%) and outpatient drug-free treatment (40%). Both MMT and therapeutic community treatment were associated with reductions in drug use (Hall et al., 1998).

Johnson (1997) in a review of clinical trials of buprenorphine in the United States concluded that in terms of retention in treatment and proportion of opioid-positive urine samples, buprenorphine, at doses between four and 16 mg/day, is more efficacious than placebo and equivalent to methadone at doses between 20 and 60 mg. Mattick, Kimber, Breen, and Davoli (2003), in a systematic review, found no advantage for high dose (6–12 mg) buprenorphine over high dose (60–80 mg) methadone in retention (RR = 0.79, 95% CI: 0.62–1.01) and high dose buprenorphine was inferior in suppression of heroin use. Buprenorphine was found to be statistically superior to placebo medication in retention of patients in treatment at all dose levels, but only high and very high doses of buprenorphine suppressed heroin use significantly above placebo. Two other recent meta-analyses have also found relative equality of methadone and buprenorphine in terms of retention in treatment and suppression of heroin use (Barnett, Rodgers, & Bloch, 2001; West, O’Neal, & Graham, 2000). Further research is required to tease out and clarify the differences in efficacy between methadone and buprenorphine.

In addition to the effects on drug use and HIV risk behaviour, there is evidence that substitution treatment for HIV-positive IDUs is associated with better compliance with treatment and improved health outcomes (O’Connor, Selwyn, & Schottenfeld, 1994). Weber, Ledergerber, Opravil, Siegenthaler, and Luthy (1999) followed a cohort of 297 current and former IDUs, all of whom were HIV-positive but asymptomatic and had similar CD4 counts at entry to the study. During follow-up (median 16 months), 80 subjects adhered to a MMT programme, 124 continued injecting drug use and 93 remained free of illicit drugs. The authors found a significantly lower probability of HIV progression in both the methadone treated group (RR = 0.48) and the former drug users (RR = 0.66) than in persistent IDUs (RR = 1.78). Opioid substitution programmes also provide opportunities for expanded HIV prevention among IDUs and a platform for HIV treatment and care, including the implementation of directly observed antiretroviral therapy for opioid-dependent people living with HIV/AIDS as well as therapy for opportunistic infections such as tuberculosis (WHO, UNODC, UNAIDS, 2004). To date there is limited research on the impact of opioid agonist pharmacotherapy on HIV/AIDS treatment outcomes, including highly active anti-retroviral therapy (HAART) adherence. Anti-retroviral treatment compliance improves in the stabilisation phase of MMT. Avants and colleagues (2001) found that at entry into MMT, less than 80% of people reported adherence to their HAART treatment regimen, however, a significant increase in adherence occurred during the first 4-week MMT stabilisation phase.

Consideration needs to be given to interactions between opioid substitution drugs and HIV/AIDS treatment. Buprenorphine’s pharmacokinetic and pharmacodynamic
interactions with antiretroviral agents have been studied and, unlike methadone, which has an adverse interaction with zidovudine (McCance-Katz, 1998), buprenorphine does not increase zidovudine concentrations (McCance-Katz, Rainey, Friedland, Kosten, & Jatlow, 2001). HIV-positive patients using a HAART regimen including efavirenz frequently suffer a severe opioid withdrawal syndrome (McCance-Katz et al., 2002). This withdrawal apparently occurs as a result of efavirenz induction of cytochrome P450 3A4, which is chiefly responsible for methadone and buprenorphine metabolism.

Overall, there may be significant interactions between opioid substitution and HIV/AIDS treatment, and clinicians need to monitor and adjust doses accordingly. Evaluation data are required to indicate the range of interactions of the different agonist medications.

**Antagonist and aversive pharmacotherapy programmes**

An antagonist is a blocking agent, which stops the drug of dependence from having an effect, removing the euphoria and other desired effects. An aversive agent interacts with the drug of dependence to produce an unpleasant (aversive) reaction. If drug users are exposed to drug-related cues without the positive reinforcement of euphoria, (and possibly with the negative reinforcement of an aversive agent), over time, drug-seeking behaviour and craving are extinguished (Tucker & Ritter, 2000).

Currently the only antagonist being used in relapse prevention treatment programmes for opioid dependence for IDUs is naltrexone. Aversive agents and “vaccines” are under consideration for the treatment of cocaine dependence but are not currently available (Shearer & Gowing, 2004).

The limitations of research evidence relating to the use of naltrexone for relapse prevention treatment of opioid dependence means that it is currently not possible to draw firm conclusions as to its effectiveness (Kirmayer, Davoli, & Verster, 2003; Tucker & Ritter, 2000). Despite the low level of side effects, patient acceptance of naltrexone is poor (Brahen, Henderson, Capone, & Kordal, 1984; Tucker & Ritter, 2000; Zador, Adams, & Curry, 1999).

Retention rates are highest for highly motivated participants (Brahen, Henderson, Capone, & Kordal, 1984; Tucker & Ritter, 2000; Washton, Gold, & Pottash, 1984). Tucker and Ritter (2000) also note that the highest rates of post-treatment abstinence occurred in highly motivated patients. For example, Cornish et al. (1997) reported 8% opioid-positive urine samples in parolees and probationers after six months of naltrexone treatment, while Washton, Gold, & Pottash (1984) reported 100% of physicians and 64% of business executives were abstinent at 12 months after naltrexone treatment. This compares with rates of 31–53% at 12 months for “more usual” participants (Tucker & Ritter, 2000). Overall the studies support the finding that good social support is associated with improved treatment outcomes.

**Behavioural interventions in combination with pharmacotherapies**

Behavioural interventions may be delivered in the context of abstinence-based treatments or in conjunction with pharmacological approaches. The provision of psychosocial support and counselling to encourage behavioural and emotional change is important to the overall process of treating drug dependence. Psychosocial interventions support the process of lifestyle adjustment, provide approaches to reduce risk behaviour and develop skills to cope with factors that could trigger drug use or to prevent an occasional lapse becoming a full-blown relapse.

Psychological conditioning is considered to play a large role in the initiation and continuation of drug use and with the euphoric effects of drugs acting as a strong positive reinforcement for further use. Behavioural interventions seek to modify drug-related behaviour by extinguishing conditioning, or by providing strategies to avoid or manage drug-related cues that are part of conditioning.

Behavioural interventions are also important to address risk behaviours associated with drug dependence, including injecting practices and sexual behaviour. As such, behavioural interventions delivered in conjunction with drug treatment are important to the prevention of HIV transmission.

In their review of opioid dependence treatment, Mattick, Ward, and Hall (1998) concluded that psychosocial therapy cannot be considered a stand-alone treatment for opioid dependence. Only 5–30% of long-term heroin users respond to abstinence-based treatment (Kreek, 2000). It should be noted that behavioural interventions are generally part of a broader approach (MMT or abstinence-based programmes) and as such they cannot be evaluated alone.

However, Mattick and colleagues concluded there was reasonable evidence that psychosocial therapy adds to the overall effectiveness of MMT programmes. For example, McEllan, Arndt, Metzger, Woody, and O’Brien (1993) in a randomised controlled trial, compared minimum MMT (methadone with emergency counselling and referral only) with MMT plus basic counselling (regular counselling using contingency management) and enhanced MMT (regular counselling plus social work, family and employment counselling). They
found that minimum MMT was associated with a higher rate of opiate-positive urine samples than the MMT with basic counselling group and that enhanced MMT further reduced the rate of positive samples.

Griffith, Rowan-Szal, Roark, and Simpson (2000) from a meta-analysis of controlled trials found that contingency management interventions (i.e. the use of incentives and disincentives) are effective in reducing positive urine samples in MMT (weighted mean effect size 0.25).

**Abstinence-based or abstinence focussed treatment**

Abstinence-based or drug-free treatment approaches vary considerably in their setting (outpatient, residential and self-help group) and orientation (Swindle, Peterson, Paradise, & Moos, 1995). This is an important component of treatment that is often sought by those seeking help for drug dependence, and is often very much supported by families and governments. Overall the evidence based for drug free community-based treatment is limited.

The effectiveness of different types of psychological therapy for cocaine use has been found to be variable, possibly reflecting differences in treatment intensity (American Psychiatric Association, 1995) or quality (Crisis Christoph et al., 1999).

Cognitive-behavioural interventions have not generally been demonstrated to be superior to other psychotherapies in initiating abstinence; however, research suggests that its effects may be more durable and as such more protective against relapse. Furthermore, cognitive-behavioural approaches may be more effective with more severely dependent drug users (Carroll, 1998).

In relation to amphetamine users, Baker and Lee (2003) concluded from a review of the research literature that relapse prevention and other cognitive-behavioural approaches are the most effective treatments. They suggested motivational interviewing as a strategy to assist those ambivalent about treatment, and note that there is some evidence that contingency management is effective while clients are in treatment.

Residential rehabilitation is based on the principle that a structured drug-free residential setting provides an appropriate context to address the underlying causes of addictive behaviour. These programmes assist the client to develop appropriate skills and attitudes to make positive changes towards a drug-free lifestyle. Therapeutic communities represent a subset of residential rehabilitation defined by the emphasis placed on accepting personal responsibility for decisions and actions (Swindle et al., 1995) and the use of the community as a method to promote the health, welfare and growth of the individual (De Leon, 2000).

Self-help or mutual support groups are generally based on the principles of alcoholics anonymous (AA) or narcotics anonymous (NA), which espouse a disease concept of drug and alcohol dependency with the promise of recovery, but not cure, for adherents. The “12 steps” of AA/NA contain a strong spiritual component, which emphasises the importance of reconstructing relationships with other people, including confession, restitution and an injunction to help other “alcoholics” or “addicts”. One of the benefits of self-help or mutual support groups is that they provide a mechanism to promote alternative social networks that do not support drug use. It has been found that abstinence is more likely in individuals who have formed new social networks (Powell & Taylor, 1989).

There have been very few comparative studies of the outcomes of therapeutic community treatment with good control of bias and confounding factors, making it difficult to form an accurate view of the effectiveness of this approach relative to other treatment modalities. However, Gowing, Cooke, Biven, and Watts (2002), in a recent review, formed a view of the effectiveness of therapeutic communities by looking at the consistency of outcome for the multiple follow-up studies that are available.

It is generally agreed that three months or more in treatment is necessary for enduring behavioural change. The studies reviewed by Gowing and colleagues indicate that between 30 and 50% of those entering therapeutic communities remain in treatment at around the three month mark. Median or mean lengths of stay reported range from 54 to 100 days. Hence the majority of those entering therapeutic communities do not remain in treatment for the length of time considered necessary for enduring change.

Some strategies, such as preparatory interventions prior to entry, have the potential to improve retention rates, as do approaches such as providing additional services to meet individual needs. Perhaps, the strongest message about the importance of linking therapeutic communities to other treatment approaches does not suit all people, and individuals are likely to vary in their receptiveness to the approach at different stages of substance dependence and recovery. This emphasises the importance of linking therapeutic communities to other treatment approaches to ensure there are alternatives available for those who find themselves unable to complete treatment.

As with other forms of treatment, relapse into substance use is common following therapeutic community treatment. Nonetheless, overall levels and frequency of drug use are significantly reduced by therapeutic community treatment, with the reduction still apparent 1–2 years after exit. There is value in considering this approach as part of overall HIV prevention as all of those who achieve long-term abstinence dramatically reduce their risk profile for both injecting and drug related death. However, this needs to be balanced by the risks that arise when individuals relapse to chaotic and dependent drug use. It is estimated that at least 70–80% will relapse so that interventions such as MMT become very important for the bulk of the target treatment population.

There is a strong indication from studies that the amount of time spent in treatment is a significant determinant of treatment outcome, but this is a complex issue with time being something of a proxy indicator for engagement, participation and progress in treatment.
Avants, Warburton, Hawkins, Pascoe, Carne, and Margolin (2000) also note previous research with drug dependent populations reporting that concurrent psychiatric difficulties are related to risk taking behaviour.

In a cohort of MMT clients, benzodiazepine users were found more likely to have injected recently, used moreamphetamine and cocaine, and used more drug classes in the month preceding interview. In addition, benzodiazepine users were significantly more likely to have recently both borrowed and lent used needles. The relationship between benzodiazepine use, higher rates of drug use and risk-taking was maintained even though benzodiazepine users had been in treatment longer and were on higher methadone doses (Darke, Swift, Hall, & Ross, 1993).

The effectiveness of agonist pharmacotherapy for opioid dependence in reducing the risk of HIV infection may also be reduced by concomitant injecting use of cocaine. For example, in a study of IDUs currently in MMT, Bux, Lamb, and Iguchi (1995) found that cocaine users were significantly more likely to report injecting a drug in the previous month than non-users (85% versus 23%) and reported a greater mean number of drug injections (22.5 versus 3.7). Camacho, Bartholomew, Joe, Cloud, and Simpson (1996) reported a gender and cocaine use effect for use of ‘dirty works’ at least once in the prior 30 days.

**Factors influencing outcomes**

The underlying risks for HIV infection may differ in various subgroups of IDUs. For example, in a cohort of 91 male drug users (around half currently in treatment), Kelley and Pery (2000) found that on a lifetime measure of drug risk behaviours, those with anti-social personality disorder reported higher rates of intravenous drug use and frequency of equipment sharing, a higher number of equipment-sharing partners and lower rates of needle-cleaning. On a measure of past-month risk behaviours, those with anti-social personality disorder reported higher rates of injecting drug use and lower rates of needle-cleaning. Avants, Warbuton, Hawkins, and Margolin (2000) also note previous research with drug dependent populations reporting that concurrent psychiatric difficulties are related to risk taking behaviour.

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**Major observational studies of treatment outcomes**

Large-scale observational studies have had an important impact on our knowledge and understanding of treatment and the treatment process; since they have measured the impact of treatment in a range of real life settings across large geographical areas. While these studies do not enable us to calculate treatment effect sizes (that is to provide a numerical estimate of the size of the treatment impact) in comparison with no treatment, they do provide some idea of the likely impact and outcome of treatment. These studies also allow monitoring of changes in patterns of presentation and patterns of drug use in people presenting.

A series of large cohort studies in the United States have been conducted each decade for the past three decades: the Drug Abuse Research Program (DARP) in the 1970s, the Treatment Outcome Prospective Study (TOPS) in the 1980s and the Drug Abuse Treatment Outcome Study (DATOS) in the 1990s (Hubbard, Craddock, Flynn, Anderson, & Etheridge, 1997). There was also the National Treatment Outcome Research Study (NTORS) in the United Kingdom in the 1990s (Gossop et al., 1997). The Australian Treatment Outcome Study (ATOS) began in January 2001 (Darke et al., 2005).

In these studies, clients are assessed at intake, during and after treatment. These studies provide the data to: evaluate treatment systems where clients engage in multiple treatments of varying intensities and duration; show if the desired outcomes are achieved; and identify groups of clients who change most or least. They can also show how outcomes vary with the amount or type of treatment received. However, as these studies do not control for many other factors (e.g. non-treatment
The two most recent studies (DATOS in the United States and NTORS in the United Kingdom) reported on the impact of treatment on injecting and other HIV-related risk-taking behavior, which showed significant reductions over time. In the DATOS study, all modalities of treatment are reported to have significantly reduced injecting risk behavior; while retention in treatment is demonstrated to be linked both to greater reductions in HIV risk behavior and to lower baseline rates of HIV risk-taking behavior. In the DATOS cohort, it is clear that the HIV-related injecting risk-taking behavior profile of those entering MMT is significantly different from those entering residential and community-based drug-free treatment where there were higher rates of cocaine and crack users as well as non-injectors. This means that those entering MMT were more likely to be heroin injectors and to have a higher HIV risk-taking profile. In the NTORS study, a subsection of the total cohort was followed for 5 years. The majority of the original cohort had used drugs by injecting prior to treatment. The rate of injecting fell from 60% at intake to 37% at 4-5 years follow-up and the rate of self-reported sharing fell from 14 to 5%. These results apply to clients admitted to both community-based MMT and residential treatment.

Cost effectiveness of treatment

The data available on the benefits of investing in treatment indicate that all the treatments are significantly beneficial when compared to not delivering treatment. The impact of reducing HIV rates in Europe and Australia through substitution treatment has been demonstrated to be highly cost effective. Research on cost effectiveness indicates that in the NTORS study there was a three-fold saving in the social and health care costs for every single unit of spending, indicating an overall cost benefit deriving from treatment (Gossop, Marsden, & Stewart, 1998; Godfrey, Stewart, & Gossop, 2004). An earlier study in the United States returned a similar, if somewhat larger cost benefit finding, reporting a seven-fold saving for every single unit cost of expenditure when criminal justice and other costs were incorporated (Gerstein & Harwood, 1994). There is also clear evidence that incarceration is related to 90% plus relapse rates and alternatives to incarceration are highly cost effective. A recent UNODC (2003) document makes a very strong case for the cost effectiveness of investing in treatment. There is a strong international consensus that the costs of treatment are offset by reduction in costs to the public health and criminal justice system in the medium and long term.

Scope of drug dependence treatment

The global number of persons with opioid dependence receiving prescribed methadone is estimated to be over half a million and to be on the increase in practically all regions of the world. Originally implemented in Western Europe and the United States, MMT of opioid dependence is expanding eastwards to Central and Eastern Europe, to the Eastern Mediterranean Region and to South-East Asia.

Globally, MMT has become the most frequently used pharmacological approach for heroin dependence. It covers over 80% of the estimated treatment needs in some European countries; in other countries coverage is much lower. In the European Region, 76% of substitution treatment programmes use methadone (EMCDDA 2000). Programmes, albeit on a small scale, have also been established in such diverse countries as China, Indonesia, Iran, Kyrgyzstan, Nepal and Thailand. It is estimated that a million opioid dependent people will be in MMT within the next 5 years.

BMT is currently available in 29 countries: Australia, Austria, Belgium, China (Hong Kong), Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Indonesia, Israel, Italy, Lithuania, Luxembourg, Malaysia, Netherlands, Norway, Portugal, Singapore, Slovak Republic, Slovenia, South Africa, Sweden, Switzerland, Ukraine, United Kingdom, and United States. It is also reported that BMT is available in Iran (Ahmadi, 2003). In many of these countries BMT is not available nation-wide and regulations and treatment philosophies vary enormously between countries (The Coordinating and Information Resource Centre for International Travel by Patients Receiving Methadone and other Substitution Treatments for Opiate Addiction, 2004). France has the least restrictive regulation of buprenorphine and has allowed all registered medical doctors to prescribe buprenorphine without special license or education since 1995 (Auriacombe, Fatisas, Dubernet, Daulouede, & Tignol, 2004). By 1998, 65,000 patients per year were in buprenorphine treatment and by 2001 this had increased to 74,000, while 9600 were treated with methadone (Auriacombe et al.; 2004). In Australia, buprenorphine was registered for the treatment of opioid dependence in 2001, and as of 30 June 2004, there were 8641 patients registered as receiving BMT. While buprenorphine is registered in a number of other countries; the number of enrolled patient is not available.

Globally, there is great diversity in the range and coverage of other drug dependence treatment programmes being delivered. In most developing countries, few specialised services exist, particularly outside of major urban areas. Where drug dependence treatment services do exist they are often linked to psychiatry or other mental health services, with no, or very limited, links to HIV/AIDS or other infectious diseases services. In many developing and transitional countries drug users are primarily managed through ministry of
justice, social welfare and correctional services, with limited access to HIV and other health care services. Closed drug dependence treatment and detention centres, in themselves, often pose significant risks for HIV transmission.

Conclusions and recommendations

In many countries, there has been substantial success in containing HIV transmission among IDUs, particularly where there is an aim of providing a comprehensive and varied range of treatment services.

All countries with a population of IDUs should aim to develop a comprehensive range of treatments, including drug substitution maintenance treatment for opioid dependence. Policy-makers need to be clear that the development of drug substitution treatment is a critical component of an HIV prevention strategy among injecting opioid users.

In addition, studies of treatment in the United Kingdom and the United States indicate that there is a range of a three to seven fold benefit in relation to the unit of expenditure (Gerstein & Harwood, 1994; Gossop et al., 1998; Godfrey et al., 2004).

Opioid agonist pharmacotherapy remains controversial and many authorities are resistant to the use of such treatments. The major impediments to substitution treatment are: policy-makers are often doubt the effectiveness in their setting; policy-makers question the financial benefits; policy-makers fear the adverse consequences of diversion and increased drug use in the community.

This paper has demonstrated that there is evidence that MMT is associated with a significant decrease in injecting drug use and sharing of injecting equipment. Evidence on sex-related risk behaviour is limited, but suggest that MMT is associated with a lower incidence of multiple sex partners or exchanges of sex for drugs or money, but no change, or only small decreases, in unprotected sex. Studies of seroconversion, which is the toughest and most robust standard for assessing the role of methadone in HIV prevention, suggest that the reductions in risk behaviours do translate into actual reductions in cases of HIV infection. While the data on HIV risk behaviour are limited, there is strong evidence that substitution treatment with either methadone or buprenorphine suppresses illicit opioid use. There is also evidence that substitution treatment for HIV-positive IDUs is associated with better compliance with treatment and improved health outcomes.

Policy-makers need to be made aware of the high social, public health and budgetary costs as well as the increases in HIV infection rates and the number of deaths if such treatments are not put in place. Countries without such treatment are among those currently reporting major HIV outbreaks. This situation is also likely to continue unless comprehensive community-based treatment and prevention approaches are rapidly developed and implemented.

References


