The impact of substitution treatment in prisons – a literature review

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ABSTRACT

Substitution treatment (ST) has established itself as a generally recognised type of treatment for opioid dependence worldwide. Although the number of countries providing ST in prison has slowly started to grow over the last years, its application in the custody setting remains controversial. ST in prison is mainly employed in form of detoxification. Maintenance treatment is provided in only a limited number of international prisons.

This literature review is centred around the question: “What is known about the effectiveness of prison based ST?” Furthermore, it investigates how this knowledge can be applied to improve treatment scope and quality. Effectiveness, as defined by the examined studies, refers to short- and long-term reduction of drug use and relapse, reduction in drug use related risk behaviours, reduction in criminal conduct and recidivism, facilitating the manageability of drug using prisoners and improving their physical stabilisation. In this context, substitute dosage, treatment duration, patient retention rates, complementary psycho-social care and the effects of disrupting maintenance treatment when entering the institution are scrutinised.

Results show that prison-based ST and especially prison-based methadone maintenance treatment (PMMT) can reduce drug use and injection in penal institutions. Moreover, PMMT provision can reduce injecting risk behaviours as well as drugs charges and re-admission rates. However, for PMMT to retain patients in treatment and reduce illegal drug use and criminal behaviour a sufficiently high dose of methadone (e.g. >60 mg) and the treatment duration lasting the entire period of imprisonment appear crucial.

On the basis of the analysed results the authors recommend the provision of PMMT for individuals with long-standing opioid dependence and suggest major expansions of prison based ST in many countries.

Keywords: Substitution Treatment, Methadone, Prison, Relapse Prevention, Crime Prevention, Drug Use Related Risk Behaviours

INTRODUCTION

Substitution treatment (ST) in its different forms has established itself as a widely accepted harm reduction and treatment measure for opioid dependent individuals in the community in many countries (Council of Europe, 2001). The effectiveness of methadone maintenance treatment (MMT) is now widely acknowledged (e.g. Farrell et al., 2005). Effectiveness refers to a reduction or cessation of opiate use (Sees et al., 2000; Strain et al., 1999; Condelli and Dunteman, 1993; Ball and Ross, 1991; Vanichseni et al., 1991; Hubbard et al., 1984;), reduced HIV risk behaviours, especially needle use (Sorensen and Copeland, 2000) and consequently reduced HIV and viral hepatitis transmission rates (Hartel and Schoenbaum, 1998; Metzger et al., 1993; Zangerle et al., 1992; Novick et al., 1990) as well as a decrease in criminal involvement and redundancy. In a common position paper UNAIDS/WHO/UNODC (2004, p.2) state “Substitution maintenance therapy is one of the most effective treatment options for opioid dependence. It can decrease the high cost of opioid dependence to individuals, their families and society at large by reducing heroin use, associated deaths, HIV risk behaviours and criminal activity. Substitution maintenance therapy is a critical component of community-based approaches in the management of opioid dependence and the prevention of HIV infection among injecting drug users (IDUs).”

However, empirical research on the effectiveness of treatment programmes for drug dependency in the penitentiary system in general and of ST in particular is hitherto rather limited and incomplete. Most scientific work on ST in prison has been carried out in the United States and Australia with only a restricted number of studies conducted in Europe, Canada or other countries, such as Iran (Jürgens, 2006). The majority of studies has focussed on methadone. Relatively newly recently authorised substitution substances such as buprenorphine, slow release morphine or even medical heroin have only recently been studied to rather restricted degrees (WHO, 2005).

Looking at substitute prescribing in the setting of penal institutions all treatment aspects present themselves as subject to controversial discussion. Comparing the prescribing practice in prison to the practice in the community the philosophies and thus formulated goals tend to diverge: As opposed to community drugs services prisons primarily aim at providing safety and rehabilitation and only secondly at health improvement. Consequently, general abstinence rather than harm reduction orientation is pursued, different values and characteristics are associated with substitution drugs (e.g. perception of methadone as an illegal “street drug” rather than a therapeutic medicament), security aspects have to be acknowledged (e.g. supervision of intake to avoid diversion of the medication (cf. Magura, 1994)), and the difference in the doctor-patient relationship (e.g. no free choice of doctor) has to be recognised. Moreover, structural conditions of the prison setting as such have to be considered (e.g. dependent on the spatial capacities of the institution the confrontation with the prison drugs scene can be increased). Whereas opiate users in the community often have easy access to methadone over the course of their drug using career, when entering prison either an automatic detoxification or a voluntary decision to interrupt drug use are common.

Arguments against prison-based ST by professionals, prison health authorities and politicians sometimes show inconsistencies. The argument, for example, that overall injection rates decline in prison for various reasons (voluntary decision, limited availability of drugs etc.), is put into perspective by scientific evidence demonstrating that the remaining injection incidence tends to be of highly risky nature (cf. Shewan et al., 1994).

While in many cases prisoners discontinue or significantly reduce their drug use when entering prison, others continue their use more riskily or might even start inhaling or injecting opiates (Allwright et al., 2000; Lines and Stöver 2005; Shewan and Stöver 2005; Wood et al., 2006).

The controversial debate around prison ST is further fuelled by the fact that opioid dependent individuals frequently alternate between being patients at one and prisoners at another time. While in the community they might be treated as patients and receive ST, in the correctional setting they are primarily treated like prisoners, who should avoid illegal behaviours, such as drug use, which again often tends to be the reason for their incarceration in the first place. The aim of prisons to enable prisoners to lead a life without committing criminal offences therefore tends to rely on an abstinence-oriented approach.

The acknowledgement of the possibility to transfer the positive experiences with ST in the community to the prison setting grows rather slowly. Yet, those prison health services recognising this possibility and in particular the benefits of 'throughcare', i.e. avoiding a treatment interruption through detoxification, are still a clear minority worldwide. However, more and more prison doctors are beginning to prescribe substitution drugs, not at last as a result of the increasing numbers of patients in the community (550.000 ST patients in the 25 EU member States (EMCDDA, 2005). Countries now providing ST in prison embrace the majority of EU member states, Australia, New Zealand, some American states and some central Asian countries. These changes can be regarded as a development towards the 'principle of equivalence' referring to the offer of medical care in the community and in prison demanded by a number of organisations, such as the WHO (WHO, 1993). Still, from the prison management point of view drug using prisoners, including prisoners in substitution therapy, are still often seen as 'security risk'. Although the medical services in many countries are organised separately and independently, controversies arise with respect to the daily routines (e.g. regarding breach of confidentiality).

This literature review examines the impact of substitution treatment in the prison setting while particularly focussing on a number fundamental issues, such as how the existing knowledge on ST in prison can be used as a baseline for adjusting the scope and quality of this treatment form in this specific location. Furthermore, it investigates substitution medications in terms of dosage, treatment duration, complementary psycho-social care and retention rates concerning imprisoned patients. The impact of ST on the reduction of drug related risk behaviours (e.g. sharing of injecting equipment) in penal institutions is looked at as well as the effects of disrupting maintenance treatment on prison entry. Besides, practical problems arising on an everyday basis concerning the provision of substitution drugs in the institution and the impact of ST on the prison atmosphere (also regarding the commitment of crime) are considered. Amongst those fundamental points are also the long-term effects of ST on release outcome.

LITERATURE REVIEW

An extensive, systematic literature review of studies relevant to the above described research concern has been carried out, which involved the utilisation of a wide range of computerised and printed sources, such as databases (e.g. Medline, PsycFIRST), the world wide web, online and conventional libraries and archives (e.g. International Centre for Prison Studies/King's College/UK, ARCHIDO/BISDRO/Germany) and personal contacts

to researchers, and other experts in the field of prison-based ST. Inclusion criteria for studies were methodological quality, expressiveness of evidence and a publishing date from 1990 on in order to contribute a piece of work complementary to the review of PMMT studies by Dolan and Wodak (1996) without creating too great an overlapping. Studies with methodologically high level (e.g. prospective randomised controlled trials with matched group design) have been given first priority, especially those covering large regional/national areas. To broaden the level of comprehension qualitative studies based on subjective perspectives of, e.g., prisoners' have purposively been included. Furthermore, due to the limited number of high quality studies complementary resources have also been integrated such guidelines and clinical practice recommendations. The vast majority of reviewed literature turned out to focus on methadone as a ST medication.

In the following research overview those studies appraised as methodologically solid and particularly exemplary in illustrating and discussing crucial issues involved in ST prescribing practices in the prison environment will be presented in detail regarding aims, methods, results and conclusions and recommendations as well as limitations. The remainder of selected studies, which still has contributed vital empirical knowledge in this matter, will be portrayed briefly with the main focus on aims and findings. In contrast to conventional narrative reviews critical endeavours have been undertaken to counteract preconception biases and synthesise conflicting findings rather than merely concentrating on evidence in favour of substitute prescription in prison.

The goals of substitution treatment in the prison setting

Substitution treatment in the specific setting of penal institutions pursues a number of different goals, which could be specified in 5 subcategories:

1. Reduction of drug use/relapse in the short and in the long term, reduction of drug use related risk behaviours and hence the transmission of infectious diseases.

2. Reduction of criminal behaviour and recidivism.

3. Improvement of prison safety through easier manageability of drug users (e.g. reduction of disruptive, institutional behaviour).

4. Comparison of substitutes in the prison setting.

5. Prison-related problems of substitution treatment in the prison setting.

Reduction in drug use/relapse and related risk behaviours (Studies examining point 1. generally tend to examine point 2. at the same time)

The reduction of illicit drug use and injecting risk behaviours, such as sharing injection equipment, which at the same time also implies a reduction of the transmission of blood-borne infectious diseases, constitute the primary aims of ST, whether in the community or in the prison setting.

In this context Dolan et al. (1998) investigated whether prison-based methadone maintenance treatment (PMMT) reduces injecting risk behaviour and consequently the

transmission of blood-borne viral infections among prison inmates. Retrospective, structured interviews were carried out in 1993 with 185 currently injecting drug users, imprisoned in New South Wales, Australia, within the last two years and recently released. Respondents, recruited at drugs treatment services, were allocated to three largely matched groups: 105 to group I (drug and alcohol counselling), 32 to group II (dosage and duration restricted prescription of methadone) and 48 to group III (prescription of methadone doses of 60mg or more for whole duration of imprisonment). Members of group III were significantly least likely to report injecting heroin, sharing syringes and scored lowest on the HIV risk-taking scale while imprisoned. Although non-significantly, they were also least likely to have injected any drug in prison. However, for prison-based MMT (PMMT) to be effective a sufficiently high dose of methadone (≥ 60mg) prescribed for the entire period of imprisonment seems decisive. Consequently, PMMT might contribute to a reduced risk of the transmitting blood-borne viruses amongst prisoners, especially when considering the known impact of adequate MMT on HIV incidence and prevalence rates among IDUs in the community (e.g. Ward et al. 1992). This study constitutes a signpost within the research area of prison based ST as it provides the first scientific evidence that PMMT can reduce injecting risk behaviour in penal institutions. Pointing to the limitations of their study - retrospective reports, no randomised group allocation of participants to equally sized groups - the authors recommend prospective, randomised studies for future research evaluating the effectiveness of PMMT.

The necessity of a minimal dosage of 60mg for PMMT to be most effective in terms of treatment retention and reductions in illegal drug use and criminal behaviour are consistent with Kreek (2000) and Ward et al. (1998).

To contrast the prevalence of drug use and injection risk-taking amongst incarcerated and community MMT patients Darke et al. (1998) conducted prospective structured interviews with 100 PMMT and 183 community MMT patients also in New South Wales. As opposed to Dolan et al. (1998) prospective reports and a control group were used. The aim was to compare the impact of the prison to the community setting. Participants, PMMT and MMT clients for at least 6 months, were recruited in two urban and three rural prisons and community drugs services, respectively. Drug use and injection behaviours of the past 6 months were examined. Community participants were significantly more likely than their prison counterparts to have injected a drug (84 vs. 44%), to have used heroin (72 vs. 38%) and to have done so more often (20 vs. 4.5 days – median). However, incarcerated patients were on the other hand significantly more likely to have engaged in highly risky injecting behaviour, e.g. to have borrowed (32 vs. 15%) or lent (35 vs. 21%) injecting equipment. The group difference in patterns of drug use was explained in terms of the considerably easier access of community drug users to both drugs and sterile injecting equipment. According to the authors MMT can neither in the community nor in prison be expected to fully solve the problem of drug use and injecting risk behaviours but definitely to alleviate both. Considering the significantly greater incidence of injecting risk behaviours within the prison group a combination of harm reduction measures, such as PMMT and syringe exchange might be recommendable.

According to their own previous recommendations (Dolan et al. 1998) Dolan et al. (2002) used a two-group, pre-post randomised controlled trial to measure the impact of PMMT on prevalence and frequency of heroin injecting, incidence of HIV and hepatitis C and the shared use of injecting equipment. 382 imprisoned male heroin users a New South Wales prison in Australia in 1997/1998 were equally divided into a PMMT and a control group. The results demonstrate that MMT provision in a prison healthcare setting can be effective

in significantly reducing heroin use (27% versus 42%), drug injection and syringe sharing among incarcerated heroin users. No group difference was measured regarding seroconversions to Hepatitis C (four participants in both groups seroconverted to HCV, no-one to HIV). These findings are consistent with the methadone literature on prison-based ST in other countries (e.g. Johnson et al. 2001).

With the aim to examine the longer-term impact of MMT on mortality, re-incarceration and hepatitis C and HIV seroconversion in imprisoned male heroin users Dolan et al. (2005) managed to re-interview 236 of their original 382 participants (see Dolan et al., 1998 above) either in the community or in prison between 3.4 and 4.7 years after the initial interview. Whereas no deaths were recorded while participants were in MMT 17 died out of MMT, representing an untreated mortality rate of 2.0 per 100 person-years. The risk of re-incarceration was lowest during periods of MMT, which lasted 8 months or longer ($P < 0.001$), although MMT periods of two months or less were associated with the greatest risk of re-incarceration ($P<0.001$). Increased risk of hepatitis C seroconversion was significantly associated with prison sentences of less than two months ($<P=0.001$) and MMT episodes less than 5 months ($P=0.01$). Participants were at greatest risk to drop out of MMT when incarcerated for short periods of only one month or less (adjusted hazard ratio 10.4 ($P<0.001$). HIV incidence was 0.3 per 100 person-years. Thus retention in MMT was associated with reduced mortality, re-incarceration rates and hepatitis C infection. This finding is consistent with studies of HIV seroconversion in IDUs in the community (Metzger, Navaline, & Woody, 1998). Consequently, the increased risk of hepatitis C infection associated with short or interrupted MMT points to the significance of PMMT programmes ensuring the continuity of treatment begun in the community with respect to the affected individual and public health. In response to this, the South Australian Prison Health Service commenced its opioid substitution program, initially to allow continuity of care for those prisoners already on a community opioid substitution program, then expanding to provide an assessment and start-up service for prisoners already in the custodial setting (Dayman, 2006).

With the intention to evaluate the efficacy of PMMT regarding the reduction of opiate use and injection risk behaviours the Ministries of Health and Justice of Catalunya initiated a 5 months pilot program of MMT prescription in a male prison in Barcelona, Spain (Boguna 1997; Mourino, Ministry of Justice of Catalunya 1994). Structured interviews were conducted with 123 incarcerated male opiate users, on average 30 years old and heroin users since the age of 17. Most participants had already been in MMT prior to incarceration. The average methadone dose prescribed in prison was 58 mg. Over the course of the program participants significantly reduced injecting and sharing syringes. However, this tendency was only significant when the entire treatment duration was more than six months. 15 participants had concomitant drug, mostly heroin, use, which was significantly more frequent with individuals who received less than 50mg. Both, the necessity of a sufficiently high dose of methadone and sufficiently long treatment duration, have also been emphasised by Dolan et al. (1998) presented above. The program was completed by 60 participants and only finished prematurely due to e.g., release, transferral or death. The high retention rate provides the opportunity of getting inmates in touch with general medical services. However, the limited duration of the program reduces the generalisability of the findings compared to programs, which are not time limited, e.g. KEEP (Magura et al. 1993, see below). Considering respondents' diverse social and health related needs a combination of prison ST and psychosocial care are recommended (Boguna, 1997; Mourino, 1994).

Crowley (1999) analysed the effectiveness of the drug detoxification programme at Mountjoy Prison in Dublin/Ireland, which consists of a 10-day methadone detoxification and a 6-week intensive rehabilitation module. Between 1996 and 1999 173 prisoners had entered the programme of whom approximately 67 (39%) were drug free in the subsequent training unit and an estimated further 35 (20%) remained drug free in the community or in another prison. The relapse rate in a follow-up after 12 months was 78% (compared to approximately 90% in other in-patient detoxification programmes). A high death rate after release was reported of which 3 out of 4 deaths were drug related. The fact that 87 out of 479 committals had been in MMT in the community prior to imprisonment, which had been discontinued on admission, suggests, that many of those on the methadone detoxification programme probably would have been treated more appropriately with a methadone maintenance programme.

Participants of a drug reduction scheme in Scotland, that involved the prescription of opiates including methadone, who were accommodated in a separated unit, had used fewer drugs than a control group (Shewan et al., 1994). However, since only two thirds received methadone the results of this study do not allow to reliably single out the impact of the substitution drug.

Herzog (1993) found that only 7% of urine samples of PMMT receiving inmates in Switzerland tested positive for heroin and a further 20% for benzodiazepines. Bertram (1991) reported positive urine samples from incarcerated PMMT patients in New South Wales to be more likely to contain benzodiazepines than morphine while Gorta (1992) found the majority of PMMT samples (90%) to be clear of non-prescribed drugs. Even though the expressiveness of these results could have been intensified by the inclusion of control groups, nonetheless PMMT obviously appears to have a substantial decreasing effect on inmates' illicit opiate use.

It has been reported that intravenous drug users recently released from prison account for 6 percent of fatal (Zador et al., 1996) and 13 percent of non-fatal overdoses in New South Wales in 1992 (Darke et al., 1996). A substantial number of fatal deaths resulting from drug overdoses after prison discharge have also been reported in many other studies (Bird and Hutchinson, 2003; Singleton et al., 2003; Verger et al., 2003; Shewan et al., 2001; Seymour et al., 2000; Joukamaa, 1998; Seaman et al., 1998; Harding-Pink, 1990). Findings of recently released prisoners appear to be at higher risk for methadone overdose (Cooper et al., 1999). Such risk situations could be successfully counteracted by prison through care of drug treatment.

Hughes (2000) carried out a qualitative retrospective investigation exploring drug injectors' views and experiences of substitute prescribing in English prisons. 24 intravenous drug users with a 6 to 8 female/male ratio, a mean age of 27 and 23 years respectively, an experience of intravenous drug, mainly heroin, use of between 9 months and 19 years and of time spent in custody between one and 18 times were interviewed in-depth. Participants were recruited in two English cities with the aid of drugs agencies and snowballing (Biernacki and Waldorf, 1981). Participants reported substantial heterogeneities and inconsistencies in prison substitute prescribing practices. These ranged from no treatment over the prescription of analgesics and sedatives to the prescription of methadone and lofexidine on a detoxification basis, and were understood to depend on prison specific prescribing practices rather than on injectors' self-identified treatment needs. The sole prescription of psychotropic drugs was commonly perceived as being inadequate in managing withdrawals. Short courses of methadone detoxifications were frequently

experienced as too short and reducing too quickly to be effective on the long term. More adequate prescribing practices were reported when respondents had been detoxified with lofexidine. None of the interviewed drug users had had experiences with MMT in prison. The frequently experienced disruption of MMT begun in the community not only resulted in physical and psychological problems and risks but also in increases in intravenous drug use, sharing of injecting equipment and subsequently in the spread of infectious diseases, which also agrees with existing quantitative findings (e.g. Shewan et al., 1994; Darke et al, 1998). However, it should be kept in mind that overall rates of drug use and injecting decrease when entering the institution. Respondents' statements of inadequacies in prison substitute prescribing practices and self-identified needs point to the necessity of 'Health Care Standards' (e.g. HM Prison Service, 1996; Reed and Lyne, 1997) which are often not met. The views of some respondents concur with national (HM Inspectorate of Prisons for England and Wales, 1996 and British Medical Association, 1997) and international (World Health Organization, 1993 and Council of Europe, 1995) recommendations that promote consistent health care policies and practices, including MMT, inside and outside prison. The contribution of qualitative research in the field of prison-based medical treatment is particularly useful, as it provides the views and experiences of those affected, which represent useful and reliable accounts (Neale, 1998), that should be considered when examining prison based policies and practices.

According to the existing literature the availability of substitution maintenance treatment in the prison environment seems to be useful with regard to the reduction of life threatening risk situation drug and especially injecting drug users might get themselves into in the context of imprisonment. For one, injecting tends to be more dangerous in prison than in the community due to reduced availability of drugs and the scarcity of injecting equipment. (Dolan and Wodak, 1996). Besides, treatment discontinuity in itself has been shown to lead to an increased probability of drug using risk behaviours, such as sharing injecting paraphernalia and overdoses, the probability for the latter being especially great after release.

In their qualitative study on prisoners' perspectives Taylor et al. (2006) emphasise positive effects of prison-based MMT such as stability in lifestyle, improved family relations and reduction in debt and risky lifestyle.

Moreover, the risk of relapse into injecting drug use is increased for recently released in any case and especially for injecting drug users (IDUs) maintained on methadone prior to imprisonment. The importance of continuing to provide ST after release has been emphasised. This point is particularly relevant in light of findings indicating that people taken off methadone once incarcerated often return to narcotic use, usually within the penal institutions, and often via injection (Shewan et al., 1994).

Further, preferably randomised studies involving control groups into PMMT would be useful in order to show these coherences even clearer. While methadone appears to be a highly suitable substitution drugs for many opiate users alternative medications, such as buprenorphine and lofexidine, which might, depending on the individual case, be a more adequate option, should also be considered (see also Howells et al. (2002) below).

Reduction of criminal behaviour and recidivism

To evaluate the effectiveness of KEEP, an MMT program for inmates at Rikers Island prison in New York, Magura et al. (1993) conducted a longitudinal follow-up investigation.

They compared post-release outcomes of KEEP participants and inmates who had detoxified from heroin at Riker's. Effectiveness was defined in terms of breaking the cycle of illicit drug use and criminal recidivism by leading heroin dependent offenders into long-term community drug treatment (through care). As the Catalunyan program already presented (Mourino, 1994) KEEP intends to primarily prevent the disruption of MMT begun prior to incarceration. The KEEP group consisted of 308 randomly sampled predominantly black and Hispanic, male, daily heroin and/or cocaine users, who had not received MMT prior to incarceration and served a sentence up to a year. The daily methadone maintenance dose was 30mg. The 138 control participants were systematically sampled and overall matched. Of all participants 250 were re-interviewed at a median of 6.5 months after release from prison. 85% of KEEP participants versus 37% of controls had applied for drugs treatment after release, primarily MMT, and 27% and 9%, respectively, were still enrolled with both group differences being significant. Consequently, KEEP can be regarded as having a modestly beneficial impact on routing untreated, criminally involved heroin dependent individuals into community drugs treatment. However, administrative and organisational as well as individual obstacles also need to be considered as barriers to treatment. Regarding relapse into crime and heroin and/or cocaine use after discharge from prison no group differences were found (88% of KEEP versus 85% of control participants). Success rates might be reduced by the frequently co-occurring crack and cocaine use of many as opiate addicts diagnosed individuals, which is not sufficiently addressed with MMT, and also through an insufficiently high methadone dose (see also Mourino, 1994; Dolan et al., 1998; Bellin et al., 1999). Moreover, to prevent relapse into crime and drug use people additionally need adequate support with overall social integration (see also Mourino, 1994). The authors emphasise the option of long-term drug treatment instead of incarceration for drug dependent offenders.

With the purpose of evaluating the efficacy of PMMT and ultimately to inform drugs policy makers Johnson et al. (2001) compared the release outcome of offenders, who participated in a PMMT program with the outcome of inmates who did not participate. Lists of offenders receiving MMT in different Canadian prisons were obtained from the responsible health care representatives. Inclusion criterion for participants were being a known heroin user, which was measured by urine analysis and a questionnaire interview at admission to prison. The experimental group comprised 303 inmates, who had received PMMT between 1996 and 1999. The 215 control participants were largely matched in the key demographic characteristics. To improve the opportunity of a follow-up only people who were prior to release were included. Release outcome measures were time spent in the community before readmission to jail and institutional misconduct before and after MMT initiation at a rate per months for the experimental group and before and after the positive urine analysis for the control group, also at a rate per month. The analysis of the results revealed a significant reduction in 'serious drugs charges' when comparing 'before and after MMT initiation'. Moreover, MMT participants were found to be readmitted at a lower rate and more gradually than the controls. However, this difference was not statistically significant. Consequently, additional research addressing issues such as continuation of treatment in the community and further community safety benefits appears recommendable.

Johnson et al. (2001) analysed the effects of PMMT on release outcome, i.e. the readmission rate, and institutional behaviour, especially regarding drug offences, in Canadian prisons. PMMT participants were compared to a group of incarcerated heroin users not in PMMT. Compared to the non-PMMT group offenders participating in PMMT had significantly lower readmission rates, were readmitted at a significantly slower rate and showed a decrease of charges, while Non-PMMT participants showed an increase. Within a

12 month period, the Non-PMMT group was 28% more likely than the PMMT group to be returned to custody. In terms of institutional behaviour, the PMMT group had a significantly reduced rate of serious drug related institutional charges following initiation of PMMT. This likely indicates a decrease in drug seeking and drug taking behaviour among PMMT offenders in comparison to Non-PMMT offenders after PMMT initiation. This study clearly indicates that participation in an institutional MMT program had a beneficial effect on outcome after release.

Bellin et al. (1999) identified 1,423 inmates receiving high dose (a median of 70 mg) and 1,371 inmates receiving low dose methadone treatment (median of 30mg) between 1996 and 1997 in New York's correctional system. In order to assess the impact of dosage on criminal recidivism, the duration between release to the community until re-incarceration was measured. They found individuals discharged on high dose methadone to be significantly less likely to return to jail than those on low dose with a median time of re-incarceration of 253 and 187 days respectively. While a fixed higher dose demonstrably reduced recidivism, the authors recommend improved monitoring of individual methadone plasma levels both in the community and in prison in order to achieve individually ideal methadone dose.

Sibbald (2002) evaluated the effects of expanding methadone maintenance inside federal Canadian prisons. The Canadian prison policy developed from 1998 regarding methadone prescribing practices in prison (all inmates having received methadone in the community were permitted to continue the treatment in prison) to 1999 (under certain circumstances all severely addicted prisoners were prescribed methadone) to 2000 (offer of PMMT to any prisoner with an opiate addiction). It was found, that after a year 41% of inmates, who had continually received MMT, were readmitted to prison, compared with 58% of opiate dependent inmates, who had not taken part in the programme.

This result has also been confirmed by Marzo et al. (2001) in France. Inmates who received PMMT while incarcerated were significantly less likely (less than half as likely) to be re-incarcerated compared to those who merely received detoxification treatment (19% vs. 39%).

While the majority of studies supports a correlation between PMMT and decreased re-incarceration rates an early Australian study (Hume and Gorta, 1989) found no difference between prisoners receiving and prisoners not receiving PMMT.

Improvement of prison safety through easier manageability of drug users

When examining the effect of PMMT on institutional behaviour Johnson et al. (2001) found that compared to the Non-PMMT group the PMMT group spent significantly less time in involuntary segregation. Consequently, it can be assumed that PMMT has a potential to calm disruptive institutional behaviour. Furthermore, a significant decrease in behaviours related to activity in the drug subculture for PMMT offenders relative to Non-MMT offenders was observed.

A correspondingly favourable impact was also reported by Mourino (1994). Neither did the program cause any pressure within the prison social structure, as had been suspected, nor did non-dependent inmates demand access. Quite the reverse was the case, as prison officers reported a significantly reduced rate of conflicts amongst participating inmates.

Similar results were also reported by Joseph et al. (1989) and Magura et al. (1993). Neither the diversion of methadone, violence nor security breaches, which the prison personnel anticipated as negative side effects of KEEP, did take place. Again, quite the reverse was reported by prison staff, who even perceived KEEP participants as easier to handle than non-participants.

Kaufmann et al. (1998) carried out a feasibility study on the factors involved in the organisation and implementation of the project KOST, which is concerned with the prescription of original heroin in the Swiss prison Oberschoengruen. Besides, it was intended to investigate whether participants were able and willing to comply with the trial conditions. During the entire duration of the evaluation study neither medical or social complications nor security related problems such as violence or stealing of heroin were reported by prison staff or inmates.

Inmates in PMMT in New South Wales reported decreases in drug use, drug-related prison violence, crime following release (Bertram and Gorta, 1990a) and considered PMMT to be more effective in preventing the transmission of HIV in prison than in the community (Bertram and Gorta, 1990b).

The non-appearance of undesirable consequences of PMMT anticipated by prison staff and PMMT objectors, such as disruptive behaviours, diversion of methadone or security breaches were also reported in other studies (Heimer et al., 2005; Bertram, 1991; Gorta, 1987; Wale and Gorta, 1987). On the contrary, scientific findings consistently suggest that prison-based methadone maintenance treatment has a calming effect on drug users' institutional behaviour, thus simplifying the manageability of inmates and their social re-integration after release. This phenomenon might be explicable in terms of the psycho-pharmacological effects of methadone, which counteract both psychological and physical cravings for opiates as well as the adverse symptoms associated with opiate withdrawals (Jürgens, 2006). Along these lines Hume and Gorta (1988) even found in an investigation conducted in New South Wales that 86% of prison staff experienced a PMMT program as providing benefits for the individual, the prison management and the community.

Taylor et al. (2006) emphasise the technical and logistical difficulties and consequent health and safety aspects associated with PMMT. These include dispensing methadone adequately to all incarcerated PMMT clients, monitoring shortcomings and potential abuse of the PMMT system, e.g. holding back methadone for illicit sale.

Comparing substitutes in the prison setting

Hitherto the effectiveness of different substitutes within the prison setting compared to each other has hardly received any scientific attention.

One example is a randomised double blind controlled trial comparing effectiveness and suitability of methadone with lofexidine in prison based opiate detoxification (Howells et al., 2002). Disadvantages of methadone detoxifications can be a fatal outcome of overdoses, which have occurred a few times in prison settings (Cairns et al., 1996; Dyer, 1999) and the dislike of it by some prisoners (e.g. Hughes, 2000; Dolan & Wodak, 1996). According to the authors, lofexidine - an alpha2-adrenergic agonist - as opposed to methadone - an opiate derivative - is less dangerous and causes fewer side effects (Washton et al., 1983; Cairns et al., 1996). The relative efficacy, side effect profiles and participant acceptability were investigated. 68 recently admitted inmates of a southern English prison for male remand

and short-term prisoners DSM-IV diagnosed for opiate dependence and induced withdrawal were randomised to receive either methadone (36 participants) or lofexidine (32 participants) for 10 days. The two groups were matched regarding recent typical daily drug use. No significant group differences were measured regarding withdrawal severity in the beginning and over the course of the trial. Although not causing a significant difference, 87.5% versus 70% completed the methadone and the lofexidine detoxification, respectively, and more lofexidine (12.7%) than methadone patients (8%) showed a side effect of low blood pressure. While lofexidine might constitute a suitable alternative detoxification medication to methadone the subjective preferences and perceived needs of dependent opiate users also need to be taken into account (Howells et al., 2002; Hughes, 2000). The authors recommend future research into the optimal treatment duration of both medications in terms of highest retention rates.

In general further research comparing the advantages and disadvantages of different substitution drugs appears recommendable.

Prison-related issues of substitution treatment in the prison setting

Whereas the previous chapters have focussed on the effects of substitution treatment for prisoners and prisons, a number of health related studies have been carried out on organisational and practical aspects and the gaps in health care provision regarding prison-based ST. Based on a survey of substitution treatment in prisons in 18 European countries Stöver et al. (2004) identified a number of structural characteristics of ST in the prison setting that cause essential differences to ST practices in the community. For example is neither the choice of the doctor free, nor of the substitution medication compared to the range of medications available in the community. In general a shift to cheaper medications can be observed, e.g. from slow release morphine to methadone in some Austrian prisons. Also the choice of the treatment duration is not free. In the majority of the examined 18 countries short-term detoxification was found to be the most likely treatment when entering prison. In prison compared to the community the doctor-patient relationship tends to be more coercive and determined by security matters. E.g. the control of illicit drug, e.g. cannabis use is stricter. Besides, anonymity and confidentiality regarding the intake situation of the medication are difficult to provide and ‘take – home’ dosages cannot be provided. The latter could otherwise contribute to patients’ re-integration process. However, a exception constitutes the provision of buprenorphine to prisoners to take in their cells, which is practice, e.g., in several French prisons.

Reviewing policies and practices of ST in prisons in 18 European countries Stöver et al. (2004) identified problem areas in the organisation of ST in prisons. Amongst the central results of the study is the likelihood of a discontinuity in treatment - most prisoners are detoxified when entering prison. Furthermore, in most of the countries studied a treatment gap persists between those requiring and those receiving ST.

While heterogeneous and inconsistent regulations and treatment modalities are common throughout Europe, they sometimes appear within the same country, region or even prison. In some countries, ST maintenance is formally limited to a period of between 6 to 12 months. Elsewhere, such restrictions apply informally but are not codified in official guidelines or regulations. In other countries, no time limits exist and ST is offered on an individual basis. In Spain and Austria, for example, general substitution in prison is standard practice. However, psychosocial care, even though generally seen as an integral part of treatment and a vital compliment to medical care, is rarely provided in any country.

With regard to methods of detoxification a great variety exists both across Europe and within individual countries. Reductions in dosage tend to fluctuate from prison to prison with schemes lasting from between 7 days and four weeks.

The provision of information concerning ST, drug-use and prison policy was seen to be lacking in many prisons. Frequently, prisoners did neither understand the goals pursued by ST, nor why specific drugs or treatment methods and criteria, such as exclusion criteria, were employed. This questions the extent to which prisoners are in the position to give their informed consent.

Although it is hard to secure anonymity and confidentiality within the prison context, attempts have been made to administer substitution drugs in a way that protects prisoners, either by accommodating all patients together in a separate wing or by delivering substitution drugs discreetly with other pharmaceuticals. However, prisoners have also been found to complain about public identification of those in treatment.

In several countries, specific training for doctors prescribing substitutes in prison is not required, preventing professionals from responding to a fast changing treatment environment and from being in the position to initiate treatment improvements. Thus specific training should be implemented. Some training programmes focussed on drug treatment in the community without being adjusted to the peculiarities of the prison setting.

Besides the shortcomings just outlined this survey also illustrates the extending scope of prison-based ST across Europe: Formally the whole of Europe, apart from Greece and Sweden, now offers ST in prisons.

Michel and Maguet (2003) looked at ST modalities in French prisons. Their starting point was the observation that care practices vary considerably from one institution to the other and that both patients and teams of healthcare professionals have frequently expressed their dissatisfaction with the way ST tends to be organised. Apart from conducting a literature review the authors assessed practices of health care with regard to ST in 22 institutions, which were representative at a national level in terms of size, type and geographical distribution. Furthermore, they interviewed prison staff in 3 penal institutions (10 persons at a time from prison governor to prison guard) and prisoners in 7 prisons. They found varying practices in ST, pointing to each prison working with a different scheme. Organisational choices were determined by the capabilities of the healthcare teams and material circumstances rather than by the needs of the prisoners. They discovered misunderstandings regarding the purpose of ST on parts of prison staff who often treated it as a detoxification treatment. Prisoners reported perceiving ST as arbitrarily organised with respect to access to care, or day-to-day organisation of treatment provision. Also they expressed their dissatisfaction with the lack of confidentiality.

The first study regarding cost-effectiveness of ST in prisons found that giving strictly controlled doses of methadone to inmates addicted to heroin not only cut re-offending rates but also cost a fraction of the expense of incarcerating prisoners for a year. According to the analysis, funded by the National Health and Medical Research Council of Australia, treating one inmate with methadone for one year costs $3,234 (The Australian 2006).

CONCLUSIONS

Existing research concerned with the effectiveness of prison-based ST has primarily been concerned with PMMT and shows that this treatment form can reduce heroin use and drug injection in penal institutions. Other form of prison-based ST have not yet been studied sufficiently to draw clear conclusion. For PMMT to be effective in contributing to health and social stabilisation a sufficiently high methadone dose (at least 60 mg have been suggested) and the prescription lasting the entire period of imprisonment appear crucial. The former also seems to be important concerning retention rates. Moreover, PMMT provision has been found to reduce injecting risk behaviours, such as sharing of injection equipment. PMMT can also increase attendance of general health care services, which would be desirable especially with respect to the often diverse physical and psychological health problems common amongst chronic drug users (EMCDDA, 2003). Furthermore, participation in PMMT has repeatedly shown to contribute to a significant reduction in drug charges and behaviours related to activities in the drug subculture. Offenders taking part in PMMT were found to have lower and slower readmission rates than Non-PMMT patients.

The scientific evidence discussed suggests the continuation of MMT begun in the community in order to prevent a new uptake of drug use and related risk as well as criminal behaviour. Besides, there exists evidence that continuous MMT can assist in transferring prisoners into drug treatment after release, e.g. as after- or through-care, and thus benefiting their social re-integration. In combination with complementary psychosocial care prison-based ST appears to be most useful to tackle prisoners' diverse social and health related needs. Consequently, further research on this particular matter is recommendable.

Both research into the subjective experiences of inmates participating in substitution programmes and research into the organisational aspects of substitution programmes points to heterogeneities and insufficiencies of prescription practices and policies in prisons (e.g. difficulties with logistics and control of intake). With regard to methadone detoxification, for example, especially short courses were frequently experienced as insufficient and inadequate to meet prisoners' (self-identified) needs (e.g. Hughes, 2000; Hannifin 1997).

The disruption of MMT when entering penal institutions can lead to physical and psychological problems, an increase in risk behaviours, such as sharing of injection equipment, as well as an increased risk of fatal overdose after release. Singleton et al. (2003) reported that in the week following release, prisoners were about 40 times more likely to die, than the general population. In order to ensure universal levels of care a major expansion of maintenance is needed in many countries. To benefit prisoners as well as society substantial developments have to be initiated to improve the quality and homogeneity of prison-based services. Besides continuity of care an improvement in co-operation between prisons and community based services.

Examples of good practice of ST should ideally be realised in the entire continuum of the criminal justice system (including jails and prisons pre-trial services, probation and parole, reentry initiatives and drug courts). Good practice examples were found in relation to (i) guidelines to clinical management and the treatment of substance use (e.g. Austria: Pont, Resinger and Spitzer, 2005), (ii) structures for ST, e.g. regular exchange between social workers, nurses, doctors and psychologists (e.g. Stöver et al., 2004), (iii) networking with community ST services (e.g. Stöver et al., 2004), (iv) the specific treatment needs of women are met according to the complexity and severity of the drug use of women admitted to prisons (e.g. Palmer 2003).

Even though the substantial scientific evidence discussed above predominantly speaks in favour of PMMT, the often deprecatory attitude of prison staff and management towards ST constitutes a serious barrier to treatment implementation in many prisons. In this context co-operation between community drugs services and prisons including prison staff education appears helpful.

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