Short Communication

Participation in opioid substitution treatment reduces the rate of criminal convictions: Evidence from a community study

Helena Vorma [a,*], Petteri Sokero [b], Mikko Aaltonen [c], Saija Turtiainen [a], Lorine A. Hughes [d], Jukka Savolainen [d]

[a] Helsinki University Central Hospital, Department of Psychiatry, PO Box 590, FI-00029 HUS, Finland
[b] National Institute for Health and Welfare, Department of Mental Health and Substance Abuse Services, PO Box 30, FI-00271 Helsinki, Finland
[c] National Research Institute of Legal Policy, Criminological Unit, PO Box 444, FI-00531 Helsinki, Finland
[d] School of Criminology and Criminal Justice, University of Nebraska, 310 Nebraska Hall, Lincoln, NE 68588-0561, USA

HIGHLIGHTS

- Mean rates of convictions decreased significantly.
- Patients with amphetamine co-dependence cut down their illicit drug use most.
- Different diagnostic groups or types of offender populations should be studied.

ARTICLE INFO

ABSTRACT

Objective: Positive outcomes associated with opioid substitution treatment include reduced illicit opioid use and lower risk of HIV and other blood-borne infections. The effect on the reduction of criminal activity remains unclear. Our aim was to investigate the impact of treatment on criminal activity using conviction register data.
Method: This observational retrospective study included all new patients (N = 169) enrolled in an opioid substitution treatment program in the Helsinki University Central Hospital Clinic for Addiction Psychiatry between 2000 and 2005. Psychiatric and psychosocial services were provided as part of the program. Patient treatments were followed up for 18 months. Data on criminal convictions were collected for approximately 3 years before and after the start of treatment.
Results: Mean rates of convictions decreased significantly during treatment. The effects were similar for total convictions, drug convictions, and property crime convictions. Although the numbers of violence and drunk driving convictions were too small to be analysed separately, on a bivariate level there was no indication of reduction in these crime types. Patients with amphetamine co-dependence fared best. Sex, age, other co-dependences or psychiatric diagnoses, negative urine analyses during the treatment, and dropping out from treatment had little impact on the outcomes.
Conclusions: Opioid substitution treatment seems to reduce criminal activity effectively. However, more information is needed to determine how treatment influences different types of criminality and which types of patients benefit most.

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1. Introduction

Opioid addiction is associated with several severe consequences, including increased participation in criminal activity. More than 60% of heroin users have been found to be involved in criminal activity during the last years before seeking treatment (Bukten et al., 2011b). The effectiveness of methadone maintenance treatment has been in the focus of several studies since the introduction of methadone in the mid-1960s. Maintenance treatment has a consistent, statistically significant effect in reducing illicit opiate use and HIV risk behaviour (Marsch, 1998; Mattick, Breen, Kimber, & Davoli, 2009). However, the findings concerning maintenance treatment and criminal behaviour have not been equally clear.

During the past years multiple studies have reported decreased criminal activity during treatment (Bukten et al., 2011a; Campbell, Deck, & Krupski, 2007; Oliver et al., 2010; Schwartz et al., 2009; Werb et al., 2008) while some, among others a recent Cochrane review by Mattick et al. (2009), reported only a slight or no effect on criminal behaviour. An earlier meta-analysis suggested that methadone maintenance treatment might be effective in reducing drug-related crimes but not criminal behaviours not directly related to drug use (Marsch,

* Corresponding author at: Ministry of Social Affairs and Health, Department for Social and Health Services, PO Box 33, FI-00023 Government, Finland. Tel.: +358 295 163 388; fax: +358 9 160 74714.
E-mail address: helena.vorma@stm.fi (H. Vorma).

1998). So far it seems that treatment may have different effects depending on the typology of criminal behaviour.

Drug dependence is strongly associated with various mental disorders. In treatment seeking opioid dependent patients, those with comorbid personality disorders have higher problem severity, including legal problems (Veilleux, Colvin, Anderson, York, & Heinz, 2010). While studies reporting treatment responses have been mixed in their findings, it appears that antisocial personality disorder is associated with illegal activities and poorer psychosocial function during and following treatment (Alterman, Rutherford, Cacciola, McKay, & Woody, 1996; Bell, Mattick, Hay, Chan, & Hall, 1997).

Opioid users frequently use a range of psychoactive substances in addition to opioids, including amphetamine. Research has shown that the use of stimulants may increase or even start newly after entry to an opioid substitution treatment program (Chaisson et al., 1989; Gossop, Marsden, Steward, & Kidd, 2002). At the same time, some individuals seem to refrain from other drug use when they are retained in treatment (Faggiano, Vigna-Taliani, Versino, & Lemma, 2004; Gossop et al., 2002). Stimulant users have been more likely to report criminal activity over follow-up (Williamson, Darke, Ross, & Teesson, 2007).

While the efficacy of substitution treatment on retention in treatment and reduction of illicit opioid use is well established, the relationship with reduction of criminal activity remains not a straightforward one. Our aim was to investigate the impact of treatment on criminal activity and different types of criminal behaviour based on changes in the rate of convictions prior to and during treatment. We expected to find higher rates of acquisitive and violent crimes among stimulant users and patients with personality disorders.

2. Method

2.1. Patients and treatment

This retrospective register-based study included all new patients enrolled in a substitution treatment program in the Helsinki University Central Hospital (HUCH) Clinic for Addiction Psychiatry between 2000 and 2005. The program provided medical, psychiatric and psychosocial services as a part of the treatment. Patients were followed-up for 18 months starting from the initiation of treatment, with some patients completing treatment in less than 18 months. The follow-up of the last patient concluded in July 2007.

2.2. Statistical analyses

Data from registers of patients were collected and mortality was followed using the official population registers. Criminal convictions were obtained from the Legal Register Centre. The Ministry of Social Affairs and Health and the register-keeping institutions approved the use of registers and data linkage.

Data on criminal convictions were available for years 1999–2007. Change in criminal offending was measured by comparing rates of offending before and after treatment initiation. The average total length of tracking was about 6 years (2196 days), i.e., 3 years before and after treatment initiation; with a standard deviation of 11 months and range of 12 to 52 months. For each individual, the length of pre- and post-treatment tracking was the same. The information on offending frequency is based on official court data on four types of crime: violence, property crime, driving under the influence (DUI), and drug offences. As one conviction may include several different acts of criminal offending, we counted individual crimes within each conviction to get a more accurate picture of offending frequency.

We used fixed-effects Poisson regression to assess the within-individual change in counts of crimes before and after the start of the treatment. By using each patient as his or her own control, fixed-effects models control for all time-invariant predictors, both observed and unobserved, addressing the problem of endogeneity and yielding unbiased coefficient estimates.

Poisson regression assumes equidispersion of event counts — i.e., the mean equals the observed variance. Overdispersed data, in which the variance exceeds the mean, may lead to underestimated standard errors. This problem often occurs because of some sort of unobserved heterogeneity. Although fixed-effects regression models control for all time-stable heterogeneity, there still may be unobserved heterogeneity that varies over time (see Allison, 2009). To address potential overdispersion, all models were estimated with jackknife standard errors (Allison, 2009). The log of follow-up time pre- and post-treatment (in years) was included as an offset in all models. This transforms the count model into a rate model that controls for differences in time at risk of conviction. Data analyses were performed using Stata/IC 11.

3. Results

Altogether 172 patients participated in the study. Three of the subjects died during the follow-up period and were omitted from analyses. The mean age of the patients was 32 (SD 8.2) years, 74% (125 patients) were males, 93% were diagnosed with other substance-related disorders (57% with amphetamine use disorders), and 76% with other mental disorders (44% with schizophrenia, mood disorders, or anxiety disorders, 64% with personality disorders, and 27% with antisocial personality). At the end of the 18 month follow-up, 141 (83%) patients stayed in the program. The proportion of those who stayed in the treatment for 12 months was 87% (147 patients).

Urine samples for a drug analysis were obtained from 136 patients (79%) for the last 12 months of the 18-month follow-up period. Seventy seven patients (57%) had urine tests negative for illicit opioids throughout the 12-month follow-up period.

In the three-year period before the start of the treatment, the average number of individual crimes in a conviction was 8.9 (SD 18.3, median 4) — ranging from 0 to 170 individual offences. Property (mean 3.8, SD 8.3, median 1) and drug-related (mean 1.9, SD 5.0, median 1) crimes were the most prevalent offence types. The average offending rate for the post-treatment period dropped to 3.6 (SD 7.8, median 1), suggesting strong treatment effects. However, as every individual had a follow-up time of different length, we needed to model the magnitude of individual change.

We estimated three fixed-effects models, one for total number of offences and separate models for property and drug-related crimes. Due to insufficient within-person variation in convictions over time, we did not estimate separate fixed-effects models for violence and DUI. If the number of offences was the same at both time periods (e.g., 0 during both pre- and post-treatment), the case contributed nothing to the model and was dropped.

Comparing convictions before and after treatment, the models provide strong evidence for treatment effects on offending rates (Table 1). Crime rates decreased in all three models, and the effects were similar for total convictions (94% reduction in mean rate of convictions), drug convictions (97% reduction) and property crime convictions (95% reduction). In other words, after controlling for time-invariant unobserved heterogeneity between patients, we found that the mean rate of

Table 1
Fixed-effects Poisson regression models with jackknife standard errors for change in total offences, drug offences and property crimes before vs. after the start of the treatment (N = 169).

	Total	Drug	Property
Constant	−2.85[a]	−3.41[a]	−2.94[a]
SE	0.12	0.15	0.14
% decrease	−94.2	−96.7	−94.7
True N	133	99	102

1% decrease = 100 ∗ (exp[constant]-1).

[a] p < 0.001.