Inpatient treatment of opiate dependence: Medium term follow-up outcomes

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Background: The outcome for opiate dependant patients seeking abstinence is unclear in this era of improved access to methadone maintenance.

Aim: Measure outcome two to three years after inpatient treatment.

Method: Opiate dependant patients admitted with a goal of abstinence were followed-up. A structured interview examined drug use and treatment in the preceding month.

Results: Five patients had died and 109 (76%) of the remaining 144 were followed up. Fifty per cent reported recent opiate misuse and 57% were on methadone maintenance. Twenty-three per cent were abstinent, i.e. neither using opiates nor on methadone maintenance. Abstinence was significantly associated with completion of the six-week inpatient treatment program, attendance at outpatient aftercare and negatively associated with a family history of substance misuse.

Conclusions: Abstinence remains an attainable goal. As the principal influence on outcome was treatment adherence, inpatient services should seek to enhance rates of program completion. Aftercare should be provided to patients. We caution against use of pre-treatment patient characteristics as criteria for prioritising access to inpatient treatment.

Declaration of Interest: None

Introduction

Large multi-centre studies, such as the National Treatment Outcome Research Study (NTORS) in the UK and the Drug Abuse Treatment Outcome Study (DATOS) in USA have shown that inpatient treatment reduces mean levels of opiate use (Gossop et al, 1999; Hubbard et al, 1997). These studies, which examine heterogeneous populations, are limited by they fact that they cannot provide prognostic information on achievement of defined goals in the treatment of specific addiction disorders. While pre-treatment patient characteristics are poor predictors of treatment outcome, patients who spend a longer time in treatment have been shown to have better outcomes (Gossop et al, 1999; Chutuape et al, 2001; van de Velde et al, 1998; Ghodse, 2002). We hypothesised that a substantial minority of patients would have attained abstinence when followed up after inpatient treatment. Secondly, we hypothesised that treatment adherence characteristics predict abstinence.

Method

Setting

There has been substantial heroin misuse in Dublin since the 1970s. In the early 1990s addiction treatment services expanded substantially, moving away from an abstinence model and towards a harm reduction model (Farrell et al 1999). Many small treatment clinics were opened in communities where opiate misuse was prevalent. General

practitioners were recruited and trained to provide treatment for opiate misuse, offering both methadone maintenance and methadone reduction (Butler, 2002). Heroin misuse accounts for the vast majority of presentations to addiction services in Dublin (Smyth et al, 2000).

Cuan Dara opened in 1995, operating as a specialist inpatient drug dependency unit (DDU) focusing primarily on detoxification. Prior to admission, all patients were expected to have commenced therapeutic work with an addiction counsellor in a community based treatment service. Additionally, all patients underwent a psychiatric assessment to examine such areas as psychiatric comorbidity and motivation to detoxify. The standard treatment program lasted six weeks. This included a ten-day methadone detoxification and a benzodiazepine detoxification if indicated. Throughout treatment patients were involved in individual therapy and group therapy. This six-week admission is longer than those DDUs included in NTORS (Gossop et al, 1998). Patients were encouraged to access one of two forms of aftercare following discharge. They could re-attend their local addiction counsellor or they could access an aftercare program in Cuan Dara one evening each week.

Patients

Consecutive admissions to the unit from July 1995 to December 1996 were included if they met the following criteria: 1/ primary diagnosis was opiate dependence syndrome, using ICD-10 criteria and 2/ they were admitted with the goal of ceasing use of all

opiates, both illicit and prescribed. Baseline information was obtained from the semi-structured interview conducted by a psychiatrist on the day of their admission.

Follow-up Interview

The core instrument used for data collection during follow-up was the Maudsley Addiction Profile (MAP) (Marsden et al, 1998). This instrument yields information on the thirty days prior to interview. Eight experienced addiction outreach workers conducted interviews. Their expertise ensured that they had the skills and knowledge to locate patients both via treatment services and through drug users' peer networks. Follow-up interviews took place between July 1998 and March 1999. It was anticipated that the range in time gaps from discharge to follow-up interview would be wide. This was a consequence of the facts that patients had been admitted over an eighteen months period and were followed up in an opportunistic manner over a ten-month period. Patients who agreed to participate in the study were paid Ir£10 (12.5 Euro). Following interview, those who described ongoing drug misuse problems were given advice and directed towards appropriate treatment services.

Statistical Analysis

The main outcome variable in this study was attainment of abstinence from opiates during the month prior to follow-up. Abstinence implied that patients were neither

misusing opiates nor being prescribed methadone. The main predictor variables were those indicating treatment adherence, i.e. completion of detoxification, completion of the six-week inpatient program and attendance at aftercare for at least six months. We also explored the possibility that pre-treatment patient characteristics might predict abstinence at follow-up. Patients followed up were compared to those whom we failed to follow-up in order to outrule any systematic bias in the follow-up group.

Categorical variables were compared using Pearson's chi squared test or Fishers exact test statistic as appropriate. Odds ratios (OR) and their 95% confidence intervals (95% CI) were reported to indicate the direction and strength of associations. A multivariate analysis was conducted to identify variables that were independently associated with opiate abstinence. All variables were eligible for entry into the final regression equation. The selection method involved using both the forward and backward stepwise selection techniques, using the likelihood-ratio test. The p value for entry was set at 0.05 and the p value for removal was 0.10. Variables entered into the final regression equation were examined for evidence of interaction.

Results

Table 1. Baseline characteristics and treatment compliance among 149 opiate dependant patients consecutively admitted to a specialist drug dependency unit in Dublin.

Characteristic	Number	(%)
Total	149	(100)
Socio-demographic and forensic history		
Accommodation		
Alone or with partner	43	(29)
With parents	90	(60)
With other relative	7	(5)
Hostel or NFA	5	(3)
Sexual Partner		
No sexual partner	56	(38)
Sexual partner uses opiates	41	(28)
Sexual partner not using opiates	49	(34)
Education		
Ceased education prior to age 15 years	45	(30)
Remained in education until at least age 15	103	(70)
Family history		
History of substance misuse	90	(60)
Parental Alcohol abuse	28	(19)
Parental opiate use	8	(5)
Sibling alcohol abuse	9	(6)
Sibling opiate use	58	(39)
Past Addiction Treatment & Psychiatric History		
Number of previous attempted opiate detoxifications		
None	49	(34)
One	41	(28)
Two or more	55	(38)
Past (non-addiction) psychiatric history	43	(29)
Inpatient psychiatric treatment	16	(11)
Substance misuse		
Principal opiate of misuse		
Heroin	131	(89)
Methadone	10	(7)
Morphine sulphate	2	(1)
Combination of opiates	5	(3)
Quantity of heroin use (per day)		
Less than 1.5 ‘quarters’	28	(22)
1.5 to 3.0 ‘quarters’	59	(47)
More than 3.0 ‘quarters’	40	(31)
Route of use of main drug		
Chase (smoke)	65	(45)
Inject	71	(49)
Oral	9	(6)
Compliance with inpatient treatment		
Completion of methadone detoxification		
Yes	119	(81)
No	28	(19)
Type of discharge		
Planned	62	(42)
Dismissed	8	(5)
Discharge against medical advice	74	(51)
Transferred elsewhere	2	(1)

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During the study period, 160 patients were admitted to Cuan Dara. All were opiate dependant. Eleven patients were admitted for stabilization of their methadone maintenance treatment and were therefore excluded. The remaining 149 sought abstinence and were eligible to participate in the study. Males accounted for 67% and the median age was 23 years (interquartile range [IQR] 20 to 28). Only 7% reported employment and 42% had been in prison. The median duration of opiate use was 4 years (IQR 2 to 8). Injecting was reported by 79%. Sixty-one per cent were diagnosed as benzodiazepine dependent. Additional socio-demographic features, family history, previous addiction treatment, psychiatric history and substance misuse characteristics are provided in table 1. Eighty-one per cent completed methadone detoxification. Overall 56% had an unplanned discharge and their median duration of the admission was 14 days (IQR 10 to 23). The median stay of the 44% who had a planned discharge was 41 days (IQR 39 to 42).

Five patients were known to have died prior to follow-up. One hundred and nine (76%) of the remaining patients were interviewed. We examined the baseline socio-demographic, drug misuse and treatment adherence characteristics of all patients and found no significant differences between those followed up and those not followed up. The period from discharge to follow-up ranged from 18 to 42 months, with a median of 29 months. Face to face interviews were conducted with all patients apart from five who completed telephone interviews. No patients were in residential treatment at follow-up.

At follow-up 45 (41%) reported heroin use and 20 (18%) reported methadone misuse. Overall, 54 (50%) reported misuse of at least one opiate. Sixteen (15%) were using heroin daily. Among the 86 patients who completed the methadone detoxification, 46 (53%) reported no recent opiate misuse. Sixty-two (57%) were on methadone maintenance treatment at follow-up.

Table 2. Association between pre-admission characteristics and treatment completion with attainment of the goal of abstinence from all opiates (both illicit and prescribed) at two to three year follow-up among 109 patients admitted to a drug dependency unit in Dublin; univariate and multivariate analysis.

			Univariate analysis			Multivariate Analysis*		
Characteristic	**Number**	**Number NOT using any opiates**	**Odds ratio**	**95% CI**	**p value**	**AOR**	**95% CI**	**p value**
Total	109	25						
Imprisonment								
Never in prison	64	19	1.0					
In prison	43	6	0.4	0.1 – 1.1	0.06			
Family history								
No family history of substance misuse	43	14	1.0			1.0		
Family history of substance misuse	66	11	0.4	0.2-1.0	0.05	0.3	0.1 – 0.9	0.04
Number of previous opiate detoxifications								
None	30	9	1.0					
One or more	76	14	1.9	0.7 – 5.0	0.19			
History of injecting drug use								
No injecting	26	10	1.0					
Injected previously	83	15	0.4	0.1 – 0.9	0.03			
Co-dependence on benzodiazepines								
No	45	14	1.0					
Yes	63	11	0.5	0.2 – 1.2	0.10			
Completion of methadone detoxification								
Incomplete	21	2	1.0					
Completed	86	22	3.3	0.70 – 15.2	0.11			
Type of discharge								
Planned	42	16	4.2	1.1 – 11.1	0.002	4.1	1.4 – 11.9	0.01
Unplanned	63	8	1.0			1.0		
Aftercare								
None or less than six months	83	14	1.0			1.0		
Six months or more	24	11	4.2	1.6 – 11.2	0.003	7.6	2.3 – 25.3	0.001

* From the logistic regression equation, the Nakelkerke $R^2 = 0.31$

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Table 2 indicates the variables associated with the main outcome variable, abstinence from all recent opiate use, both illicit and prescribed. Twenty-three per cent reported opiate abstinence. Only those characteristics which were at least weakly associated with this outcome (odds ratio greater than 2 or less than 0.5) are reported in the table. On univariate analysis, abstinence was significantly associated with completion of the inpatient treatment programme, attendance at aftercare treatment for at least six months following discharge, no previous drug injecting and absence of a family history of substance misuse. Abstinence was not associated with other socio-demographic characteristics, nor was it associated with past psychiatric history, previous addiction treatment, duration of opiate use or quantity of heroin use at baseline. The time interval from discharge to follow up was not associated with outcome.

On the multivariate analysis, it emerged that abstinence was significantly associated with completion of the inpatient treatment program (OR 4.1, 95% CI 1.4-11.9), persistence with aftercare (OR 7.6, 95% CI 2.3-25.3) and an absence of a family history of substance misuse (OR 3.3, 95% CI 1.1-9.9).

Discussion

Admission characteristics and treatment tenure.

The cohort admitted to Cuan Dara was substantially younger and had shorter histories of opiate use than their counterparts in other countries (Gossop et al, 1998, Ghodse et al 2002; Chutuape et al, 2001; Broers et al, 2000). Over 90% were unemployed but they had relatively stable accommodation with over half of the group living with parents. Over one third had a sibling who used opiates and almost one fifth reported a history of parental alcohol misuse. The rates of completion of the methadone detoxification and of the full treatment program are equivalent to those found in other inpatient settings (Ghodse et al, 1987; Gossop et al; 1986, Broers et al, 2000; Polkinghorne et al, 1996).

Follow-up

The follow-up rate achieved in this study is equivalent to that achieved in similar studies (Gossop et al, 1999; Hubbard et al 1997). Nevertheless, loss to follow-up is a concern as those patients who are difficult to locate may be more likely to be using opiates. The absence of any significant difference between the baseline characteristics of those followed up compared to those not located suggests selection bias was not prominent.

The period from discharge to follow-up varied substantially in this study due to methodological issues already discussed. We found no association between duration of follow-up and abstinence. NTORS demonstrated that the treatment gains obtained at one year remained relatively static at years two and five (Gossop et al, 2003).

Although individual patients may move between relapse and abstinence during subsequent years, the proportion of patients moving in each direction tend to cancel each other out beyond the first year after treatment.

Mortality

The five deaths which occurred in this young cohort are consistent with international mortality rates of 1 to 2 / 100 person years (Oppenheimer et al, 1994; Gossop et al, 2002). It should be noted that one of the risks associated with abstinence orientated treatments, is the increased risk of accidental overdose following relapse due to the reduction in opiate tolerance (Strang et al, 2003).

Methadone maintenance treatment

Over half of the cohort was on methadone maintenance treatment at follow-up. This indicates that many patients relapsed following discharge and subsequently re-accessed treatment. In Switzerland, Broers et al (2000) found that 35% of those admitted for inpatient opiate detoxification were on methadone maintenance when followed up after six months. Other studies have demonstrated that early relapse is a frequent outcome following inpatient treatment (Chutuape et al, 2001). This fact, that opiate dependence frequently follows a chronic relapsing course, highlights the need for an accessible and comprehensive range of therapeutic interventions for this patient group.

Drug misuse outcomes

NTORS demonstrated a significant decline in heroin misuse among patients offered residential treatment, from 74% at intake to 49% at one-year follow-up (Gossop et al, 1999). Both Chutuape et al (2001) and Broers et al (2000) found that about 30% of patients reported abstinence from heroin when followed up six months after a brief inpatient opiate detoxification. We found that although 89% of the patients were admitted with a primary problem of heroin dependence, only 41% reported recent heroin misuse at follow-up and only 15% report daily heroin use. Although baseline and follow-up data were obtained using different methodologies, our findings support the view that inpatient treatment is effective in reducing heroin misuse. Among those who completed at least the methadone detoxification phase of treatment we found that 53% denied any opiate misuse at follow-up. Gossop et al (1989) found an almost identical proportion in their six-month follow-up study.

The reduction in misuse of heroin cannot be entirely attributed to inpatient treatment. Many patients were on methadone maintenance at follow-up and this will also have contributed to the reduced rates of use. While reliance on self-report of substance misuse at follow-up may be viewed as a weakness of this study design, similar studies have found that self-report correlates highly with results of urine testing (Gossop et al, 1997; Darke, 1998).

Achievement of abstinence

At follow-up, we found that 23% had achieved their initial treatment goal of abstinence from opiates without the assistance of methadone maintenance. Most studies examining outcome following inpatient treatment report proportions using heroin before and after treatment, without making it clear that those who are abstinent from heroin at follow-up are not receiving methadone maintenance treatment (Gossop et al, 1999; Gossop et al, 1989; Broers et al, 2000; Chutuape et al, 2001). In seeking to clarify this important issue, we found that almost one in four were genuinely abstinent after an average of two and half years. This finding should be a source of optimism to patients, to commissioners of addiction services and to those who deliver similar services. It should be noted, however, that abstinence during the month prior to follow-up interview does not imply abstinence throughout the follow-up period.

In this era of harm reduction, abstinence has become a more secondary goal of treatment services. Dublin has embraced the principles of harm reduction and a well-developed treatment infrastructure existed at the time of this study (Farrell et al 1999). This included relatively easy access to methadone maintenance treatment. Reservations have long been expressed that improved access to methadone maintenance might reduce the possibility of drug misusers attaining abstinence (Bratter & Pennacchia, 1978; Gerlach & Schneider, 1991). This study indicates that it remains an attainable goal in the current harm reduction environment and confirms our first hypothesis.

Abstinent patients were more likely to have completed the inpatient treatment program and more likely to have attended aftercare treatment for at least six months. DATOS failed to demonstrate that better outcome was predicted by longer stay in short-term inpatient treatment such as that delivered in this study (Hubbard et al, 1997). This may be due to differences in treatment delivery in USA and substantial differences in the patient population as the vast majority of patients in DATOS presented with cocaine dependence. There is much other research consistent with our findings that significant improvement in outcome is associated with better treatment adherence and with transfer to long-term outpatient aftercare following inpatient addiction treatment (Gossop et al, 1999; Chutuape et al, 2001; van de Velde et al, 1998; Ghodse, 2002). Inpatient treatment is an expensive and limited resource. In order to maximise the health gain that such services can deliver we need to identify more effectively those patients who are most likely to persist with treatment. There is also a need to improve our understanding of the factors within different inpatient and aftercare programs that facilitate patient attendance. Finally, there is a need to develop imaginative measures which may actively enhance treatment adherence at all stages of the treatment process (Horwitz & Horwitz, 1993; Giuffrida & Torgenson, 1997).

The finding that a family history of substance misuse was associated with a significant reduction in the likelihood of abstinence was unexpected. There are a number of possible explanations for this finding. Environmental explanations seem most plausible. Two thirds of those who reported a family history of substance misuse identified a sibling who was misusing opiates. Returning home to an environment with an opiate using sibling may have made heroin access easier and promoted relapse (Maisto et al,

2001). It is also possible that genetic influences contribute to this finding. However, it may simply represent a chance finding as a result of a type two statistical error in view of the large number of statistical tests conducted in this study.

In common with many other addiction treatment studies, we found that patient pre-admission characteristics account for a very small proportion of the variance in outcome. Consequently, there is minimal evidence to support their use in prioritising access to inpatient treatment.

This study suggests that inpatient treatment can be an effective approach for opiate dependant patients, particularly in circumstances where the patient completes treatment and proceeds to access aftercare. Additionally, evidence from the USA indicates that it can also be a cost effective option when compared to outpatient treatments (French et al, 2000). Inpatient addiction services must strive to develop strategies to improve rates of program completion. Commissioners of addiction services should ensure aftercare is available and DDUs should actively facilitate patient transfer to such services following discharge.

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Clinical Implications

- Almost one in four patients report abstinence from opiates, without the assistance of methadone maintenance, two to three years after inpatient treatment of opiate dependence.
- Abstinence is associated with completion of the inpatient program and attendance at aftercare. Consequently, the health gain from the inpatient treatment may be enhanced by taking steps to improve rates of program completion and ensuring easy access to aftercare.
- Pre-treatment socio-demographic and drug misuse characteristics are poor predictors of outcome and should not be used as criteria for selection of patients into abstinence orientated inpatient treatment.

Limitations

- Different methodologies were used to measure substance misuse characteristics at baseline and at follow-up.
- The time-gap from discharge to follow-up varied substantially (from 18 months to 42 months).
- In common with most studies of outcome following addiction treatment, the failure to include a control group makes it impossible to determine an effect size.

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