Determinants of successful methadone maintenance treatments in two groups of patients: a first study

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ABSTRACT

BACKGROUND: drug abuse is a social and public health problem, with high costs to society. It is, therefore, important to develop effective treatments for this problem, and evaluate these by identifying determinants of successful outcomes in order to plan more efficient public health interventions.
The methadone maintenance treatment (MMT), at an appropriate dosage, is recognized as the most effective therapy for opiate addiction, but it is very important to consider the motivation and stage of change of patients for reaching treatment success. These must also be considered when investigating the determinants of MMT success. The aim of this study is to identify the determinants of successful MMT given to "heroin-addicts" attending the Drug Addiction Services of the Local Health Unit of the Italian Autonomous Province of Trento in two groups of patients, as outlined below.
METHODS: a retrospective cohort study was conducted. 393 heroin addicted patients, admitted for the first time to a MMT program in the Drug Addiction Services of Trento Local Health Unit between the years 2000-2008, were considered. Patients were divided into 2 groups on the basis of the objective of treatment suggested by the clinical team and negotiated with the patient: group A labelled high evolution, group B low evolution.
High evolution corresponds to a clinical situation in which, by opinion of the operators, the patient has the ability to pursue goals of change. In these cases, the methadone treatment is aimed at reaching a drug free condition and the goal/outcome is opioid abstinence (negative urine results in 90%-100%). Low evolution is characterized by little or no compliance to the assessment and/or therapeutic proposal aimed at achieving change. In these cases, the methadone treatment is aimed at achieving two or more of the following objectives: retention in treatment regimens, improvement of health and/or psychological distress, reduction of criminal activity, of overdose risk, of risk behavior and increase of work.
The probability of successful treatment was estimated by means of a multivariate logistic model. The Odds Ratios and 95% confidence intervals were calculated.
RESULTS: for group A, the absence of previous admissions into rehabilitation centres, and social therapy associated with MMT were associated to an overall successful treatment.
For the group B, the determinants of successful MMT were: having started treatment after 35 years, having a low educational level, not having previous imprisonments and not assuming the substance more than once a week.
CONCLUSIONS: the "program" related factors usually considered (like for instance: previous admissions into rehabilitation centres, social therapy) and "individual" ones (like for instance: having started treatment after 35 years, having a low educational level, not having previous imprisonments and not assuming the substance more than once a week), influenced the effectiveness of MMT in a different way: if for patients in high evolution group the determinants of success were more associated to "program-related" factors, in the case of the low evolution group, the positive outcome seemed to be mostly related to "individual" factors.

Key words: Methadone maintenance treatment, Outcome, Clinical evaluation

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INTRODUCTION

Drug abuse is a social and public health problem, with high costs to society. It is, therefore, important to develop effective treatments for this problem and evaluate them by identifying determinants of successful outcomes in order to plan more efficient public health interventions.

Individual factors that are positively associated to the effectiveness of treatment have been generally identified, and the suggestion is that success is associated with older age, minimal criminal involvement, having good social and family relationships, being employed and so on.

Methadone Maintenance Treatment (MMT), at an appropriate dosage, is recognized as one of the most effective therapies for opiate addiction and has brought important benefits to patient care. It has important benefits for addicted individuals and for society such as increased adherence to treatment regimens, reduction of the use of heroin, of health-risk behaviors, of overdoses, of infectious diseases related to heroin use as well as being associated with a reduction of prostitution and sexual partners.

Some studies carried out during the years 2003/2009, highlighted, among other things, the importance of methadone dosage and psychosocial intervention associated to pharmacological treatment as possible determinants of successful MMT (1-9).

Nevertheless, in the evaluation of the therapeutical projects performed on drug addicts, it is also important to keep in mind the initial clinical evaluation of the patient, in order to prepare a personal therapeutic plan. Patient's characteristics, and the ability of Drug Addiction Service operators to identify patients at risk of drop out, are elements that have been studied and well documented to be associated with the successful outcome of such programs and treatment retention (10). It is also well documented that a proper assessment process allows to set clear objectives in line with the clinical and environmental characteristics and with the patients' motivation (11-13). Furthermore, more recent evidence has always suggested the importance of patients involvement in clinical decision making, taking into account their characteristics and preferences (14, 15).

These findings have improved the development of customized treatment programs periodically negotiated with the patient: specific objectives are defined and related to expected outcomes (16-18).

When evaluating treatment programs implemented in a population of opiate addicts, however, like in any other field of therapeutic intervention in which the goal is aimed at the promotion of behavioral change and/or lifestyle changes, it is not always possible to identify a definite cause-effect relationship between the treatment performed and the results reported. In fact, very often the treatment in question is added to a variety of therapeutic interventions and is influenced by both personal and environmental variables. As such, the documented change depends not only on the therapeutic intervention but also on the effects that other stimuli to which the patient is, or has been previously, subjected to and which produce changes in his/her mind.

From these considerations it follows that the cohorts of patients undergoing MMT in Italian Drug Addiction Services are widely disparate. It is therefore not possible to exclude that documented results are influenced by the patient's motivation to change as perceived by the Drug Addiction Service operators and by the environment in which the two actors have worked.

In an attempt to reduce this variability, in Trento Drug Addiction Services, a model was applied for the classification of patients depending on the objective of the treatment suggested by the staff and negotiated with the patient.

By analyzing the information acquired as a result of a multidisciplinary assessment, the team divided the patients into two distinct groups called high evolution and low evolution. These two groups of patients differ for individual factors and expected outcome.

Specifically, high evolution corresponds to a clinical situation in which the subject, in the opinion of the operators, has the ability to pursue goals of change with respect to the symptoms and/or conditions that support it or aggravate it. These patients are offered treatments first aimed at a stabilization of their symptoms, and then at the induction of change and management of it. The team has always assumed that the path can be stopped or slowed by relapse management.

Low evolution corresponds to a clinical situation that, in the opinion of the team, is characterized by little or no compliance to the assessment and/or therapeutic proposal aimed at achieving change. These usually are patients in a pre-contemplative or contemplative phase (1, 2) or who have impaired social and/or psychiatric conditions deemed to be very relevant and unchangeable in the short term. These patients

are offered a treatment aimed at improving their quality of life.

These two groups are inherently not comparable because they have different expected objectives from the treatment.

Patients who have not yet completed the multidisciplinary assessment are included in the assessment phase, and the treatment for the reception, engagement and assessment outlined.

The aim of this study was to identify the determinants of successful MMT undertaken by "heroin-addicts" attending the Drug Addiction Services of the Local Health Unit of the Italian Autonomous Province of Trento, in two differing groups of patients, i.e. High and Low Evolution.

METHODS

A retrospective cohort study was conducted on patients undergoing outpatient MMT in the Trento Local Health Unit. Study subjects were recruited from the Drug Addiction Services of the Autonomous Province of Trento and data were restricted to heroin addicted patients, all admitted for the first time to a MMT program between the period 2000-2008, and who had completed the multidisciplinary assessment.

Patients were categorized into High (A) and Low (B) evolution categories. Group A consisted of 200 patients, group B consisted of 193 patients·

For group A, the methadone treatment is aimed at achieving a drug free condition and the outcome is characterized by the opioid abstinence (negative urine results in 90%-100%).

For group B, who were not feasibly capable of voluntarily changing the addiction situation, the expected outcome is the achievement of two or more of the following objectives (pre-defined and explained to the patient at the time of enrollment, and periodically re-evaluated every 6 months).

- Retention in treatment: the intervention remains open for at least three months and/or reaches an agreed conclusion.
- Improvement of health and/or psychological distress compared to the initial clinical picture.
- Reduction of criminal activity: reduction/absence of new legal proceedings during the course of treatment.
- Reduction of overdose risk: enhanced control of drug use as directed by health counseling.

- Reduction of risk behavior: a lifestyle compatible with health counseling and/or improved compliance with health and social care interventions proposed for the related disorders.
- Increase of work: an increase of working days during the treatment period.

Variables that were considered as possible determinants of outcome were gender, age at the beginning of the first MMT (< 35 years, ≥ 35 years), educational level (less than secondary school, secondary school or more), cohabitation (with parents or partner, alone, other), employment status (not employed, employed), presence in the family of problems such as mental diseases or substance use/abuse, previous imprisonment, previous hospital admission, previous admission into a rehabilitation centre, poly-drug abuse, associated psychotherapy, associated social therapy, frequency of drug use (daily/2-6 times a week, once a week/not used in the last month), mean daily methadone dosage (≤ 50 mg, > 50 mg), and age of first use (in years).

The probability of successful outcome was estimated by means of a multivariate logistic model. In particular, a stepwise procedure was used to identify the appropriate model in the context of a multiple regression. The Odds Ratios and 95% confidence intervals were calculated.

The logistic regression was performed using the statistical software STATA 8.

RESULTS

Table 1 shows the characteristics of the two study groups. Most patients were male (more than 80%) and aged less than 35 years old at the beginning of their first treatment in one of the Drug Addiction Services of Trento.

As far as the group A was concerned, Table 2 shows the results of the multivariate logistic model.

Those who had previous admission into a rehabilitation centre had a lower probability of successful MMT compared to those who hadn't (OR=0.32). Moreover, patients who underwent social therapy associated with MMT had a higher probability of success if compared to those who didn't associate such therapy (OR=2.64).

The situation was different for group B. In this case, the determinants of successful MMT were having started treatment after 35 years of age (OR=2.24), to have an educational level less than secondary school

(OR=0.46), not to have had previous imprisonments (OR=0.33) and not assuming the substance more than once a week (OR=2.18).

At the limit of statistical significance were also employment status, the presence of problems such as mental diseases or substance use/abuse within family members, and having had previous hospital admissions.

TABLE 1

DESCRIPTIVE ANALYSIS		Group A		Group B	
		No.	%	No.	%
Successful MMT	no	34	17%	63	33%
	yes	166	83%	130	67%
Gender	male	160	80%	161	83%
	female	40	20%	32	17%
Age at the beginning of the MMT	< 35 years	111	56%	108	56%
	≥ 35 years	89	44%	85	44%
Educational level	Less than secondary school	132	66%	125	65%
	Secondary school or more	68	34%	68	35%
Cohabitation	With parents or partner	127	63%	102	53%
	alone	37	19%	53	27%
	other	36	18%	38	20%
Employment status	not employed	86	43%	105	54%
	employed	114	57%	88	46%
Presence in the family of problems such as mental illnesses or substance use/abuse disorders	no	125	62%	119	62%
	yes	75	38%	74	38%
Previous imprisonment	no	187	93%	161	83%
	yes	13	7%	32	17%
Previous hospital admission	no	193	96%	185	96%
	yes	7	4%	8	4%
Previous admission into a rehabilitation centre	no	161	80%	143	74%
	yes	39	20%	50	26%
Poly-drug use	no	70	35%	61	32%
	yes	130	65%	132	68%
Associated psychotherapy	no	121	60%	149	77%
	yes	79	40%	44	23%
Associated social therapy	no	114	57%	104	54%
	yes	86	43%	89	46%
Frequency of drug use	daily/2-6 times a week	43	21%	73	38%
	once a week/not used in the last month	157	79%	120	62%
Mean daily methadone dosage	<= 50 mg	152	76%	138	72%
	> 50 mg	48	24%	55	28%
Age of first use	mean (years)	20		20	
	sd (years)	6		5	

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DISCUSSION

It's interesting to note that program related and individual related factors are usually considered in literature as influencing the effectiveness of MMT and, in this instance, they were of different importance in the two groups. For high evolution patients, program-related factors were the determinants of success.

For these, and in accordance with studies carried on by McLellan (12), the effectiveness of psychosocial treatment associated with methadone, respect to the methadone alone, reaches more than double (OR=2.64); not less important was the negative association between outcome and previous admission into a rehabilitation centre, a factor that must be taken in account when assessing the patients' involvement.

Concerning the other group (low evolution), among the determinants of positive outcome was, "not to have had previous imprisonments". In this case the problem of addiction affects the criminal action in two dimensions: on one hand there is the discipline that regulates and sanctions the use of substances and any conduct related to their abuse, and, on the other hand, there is the issue of a drug-related offense for any relevant criminal conduct committed under the influence of drugs.

The authors intended to emphasize the importance of the initial clinical assessment of the patients admitted to MMT programs, in order to build a personalized therapeutic plan with individual goals. The importance of a "pre-therapeutic" phase in which operators of Trento Local Health Unit "take their time" in order to carefully assess the situation of the patient and then develop a detailed program and a specific

TABLE 2

RESULTS OF THE MULTIVARIATE LOGISTIC MODEL DETERMINANTS OF SUCCESSFUL MMT FOR GROUP A (N=200)		OR	CI 95%
Previous admission into a rehabilitation centre	no	1	
	yes	0.32	0.13 – 0.77
Associated social therapy	no	1	
	yes	2.64	1.12 – 6.19

TABLE 3

RESULTS OF THE MULTIVARIATE LOGISTIC MODEL DETERMINANTS OF SUCCESSFUL MMT FOR GROUP B (N=193)		OR	CI 95%
Age at the beginning of the MMT	< 35 years	1	
	≥ 35 years	2.24	1.10 – 4.54
Educational level	Less than secondary school	1	
	Secondary school or more	0.46	0.23 – 0.92
Employment status	not employed	1	
	employed	1.92	0.96 – 3.84
Presence in the family of problems such as mental illnesses or substance use/abuse	no	1	
	yes	0.52	0.26 – 1.07
Previous imprisonment	no	1	
	yes	0.33	0.14 – 0.81
Previous hospital admission	no	1	
	yes	0.26	0.05 – 1.23
Frequency of drug use	daily/2-6 times a week	1	
	once a week/not used in the last month	2.18	1.12 – 4.26
Mean daily methadone dosage	<= 50 mg	1	
	> 50 mg	1.67	0.78 – 3.60
Age of first use		0.96	0.90 – 1.02

intervention is specifically highlighted, negotiating the treatment plan with the patient and respecting those who don't want to or can't overcome the situation of drug addiction.

These patients can, and must, be cured: it is sufficient to adapt the treatment goals.

The most obvious critique of the model presented in this study is the reliability of the multidisciplinary assessment, because reproducible diagnostic pathways documenting the conditions for inclusion into a High or Low evolution category have still not been identified. According to the opinion of the authors, the clinical evaluation of those enrolled in MMT must be accurate, and can't ever be considered exhaustive.

References

(1) Amato L, Davoli M, Minozzi S, et al. Methadone at tapered doses for the management of opioid withdrawal. Cochrane Database Syst Rev 2005; (3): CD003409. Review

(2) Gowing L, Ali R, White JM. Buprenorphine for the management of opioid withdrawal. Cochrane Database Syst Rev 2009; (3): CD002025. Review

(3) Amato L, Minozzi S, Davoli M, et al. Psychosocial and pharmacological treatments versus pharmacological treatments for opioid detoxification. Cochrane Database Syst Rev 2008; (4): CD005031. Review

(4) Mattick RP, Breen C, Kimber J, Davoli M. Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. Cochrane Database Syst Rev 2009; (3): CD002209. Review

(5) Faggiano F, Vigna-Taglianti F, Versino E, Lemma P. Methadone maintenance at different dosages for opioid dependence. Cochrane Database Syst Rev 2003; (3): CD002208. Review

(6) Gowing L, Farrell M, Bornemann R, et al. Substitution treatment of injecting opioid users for prevention of HIV infection. Cochrane Database Syst Rev 2008; (2): CD004145. Review

(7) Mattick RP, Kimber J, Breen C, Davoli M. Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. Cochrane Database Syst Rev 2008; (2): CD002207. Review

(8) Amato L, Minozzi S, Davoli M, et al. Psychosocial combined with agonist maintenance treatments versus agonist maintenance treatments alone for treatment of opioid dependence. Cochrane Database Syst Rev 2008; (4): CD004147. Review

(9) Amato L, Davoli M, Minozzi S, et al. Should psychosocial intervention be added to pharmacological treatment for opiate abuse/dependence? An overview of systematic reviews of the literature. Ital J Public Health 2006; 3: 15-20

(10) Goubert D, McKay JR, Burke M, et al. Treatment program progress: reliability and predictive validity of the treatment program progress rating scale. Am J Addict 1996; 5: 174-80

(11) Simpson DD, Joe GW, Rowan-Szal GA. Drug abuse treatment retention and process effects on follow-up outcomes. Drug Alcohol Depend 1997; 47: 227-35

(12) McLellan AT, Woody GE, Metzger DS et al. Evaluating the effectiveness of addiction treatments: reasonable expectations, appropriate comparisons. In: Egertson J, Fox D, Leshner A. (Eds.), Treating Drug Abusers Effectively 1997; Blackwell, Oxford

(13) DiClemente CC. Il processo di cambiamento. [The process of change] Ital Heart J 2001; 2 (suppl 1): 48-52

(14) van der Weijden T, Légaré F, Boivin A, et al. How to integrate individual patient values and preferences in clinical practice guidelines? A research protocol. Implementation Sci 2010; 5: 10-18

(15) Trujols J, Siñol N, Iraurgi I, et al. Patient and clinician's ratings of improvement in methadone-maintained patients: Differing perspectives? Harm Reduct J 2011; 8: 23-29

(16) Gossop M, Marsden J, Stewart D, Treacy S. Outcomes after methadone maintenance and methadone reduction treatments: two-year follow-up results from the National Treatment Outcome Research Study. Drug Alcohol Depend 2001; 62: 255-64

(17) Lovaste R. Analisi e progettazione organizzativa di un Servizio per le tossicodipendenze in una logica aziendale. [Analysis and organizational design of a drug addiction service in a business logic]. Mission, 14/2005. Italian

(18) Gori M, Colasante E, Mariani F. Valutazione dei determinanti dell'esito dei trattamenti metadonici in una coorte di soggetti presi in carico presso i SerT della città di Trento. [Evaluation of the determinants of the outcome of methadone treatment in a cohort of individuals taken in charge at the drug addiction service of Trento]. Mission, 19/200. Italian

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