Jundishapur J Health Sci. 2014 October; 6(4): e23475. DOI: 10.5812/jjhs.23475

Published online 2014 October 20. **Research Article**

The Effectiveness of Methadone Maintenance Treatment in the Reduction of Anxiety and Depression Among Drug-Related Prisoners

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Received: July 5, 2014; **Revised:** August 30, 2014; **Accepted:** September 7, 2014

Background: Methadone effectively alleviates psychiatric disorders.

Objectives: The aim of this study was to evaluate the effectiveness of methadone maintenance therapy in reduction of anxiety and depression among drug-abuser prisoners in Ahvaz Karoon's prison.

Patients and Methods: In our interventional case-control study, 100 drug-abuser prisoners in Ahvaz Karoon's Prison, Iran, with the symptoms of depression and anxiety according to symptom checklist (SCL-90-R) were divided into methadone and control groups. Methadone group prisoners filled out the questionnaire at the beginning of the study and 6 months after methadone therapy and their scores were recorded. Similarly, 50 control group (without methadone or any other therapy) prisoners filled out the SCL-90-R and their scores were recorded. Afterwards, the data were collected and analyzed statistically by SPSS version 20. Independent T-test was used for comparison between the case and the control group.

Results: The average ages of control and methadone groups were 42.24 ± 9.8 and 42.30 ± 9.8 years, respectively. The difference between groups regarding depression in methadone group (0.67 ± 0.49) and control group (2.82 ± 0.67) was significant (P = 0.001). The difference between methadone (0.59 ± 0.24) and control (2.56 ± 0.38) groups regarding anxiety was significant (P = 0.001). The difference in obsession between methadone (0.51 ± 0.25) and control (2.78 ± 0.43) groups was significant (P = 0.001). Moreover, the difference between hostility in methadone (0.61 ± 0.43) and control (2.48 ± 0.52) groups was significant (P = 0.001).

Conclusions: This study indicated that methadone effectively alleviates psychiatric disorders in drug addicts . Furthermore, methadone maintenance treatment improved patients' quality of life and kept them in a mood-stabilization stage.

Keywords: Anxiety; Depression; Prisoners; Methadone; Addiction

1. Background

According to the definition by the Diagnostic and Statistical Manual of Psychiatric Disorders (DSM-IV), the relationship between the man and narcotics has two major characteristics: drug abuse and dependency (1). Dependency is identified with drug tolerance and withdrawal symptoms. Drug abuse is mostly associated with another psychiatric diagnosis (1, 2). Studies indicated that 65% of addict women and 75% of addict men are affected with another psychiatric disorder along with addiction (1, 3). Prevalent addiction-associated disorders include: antisocial personality disorder, phobia and other anxiety disorders, depression disorders and dysthymia (2, 3). Therefore, these disorders will be hopefully treated or at least alleviated with the treatment of addiction. Drug-related crimes currently comprise the highest rate of crimes and drug-related individuals comprise 47% of prisoners (4, 5). Researches have indicated that drug-induced mortality in our country has increased during the past years. The main cause of this mortality is overdose and subsequent fatal poisoning. Sometimes poisoning is caused intentionally due to depression, which is not treated since patients do not refer to a psychiatrist (4). Nowadays, dependence on opiates such as opium and heroin and their abuse has become a global crisis (6). Drug abuse and dependence were known as addiction before 1964, but the term was replaced with the recommendation of the WHO in order to reduce its psychosocial burden (5). One of today's national priorities in Iran is the identification of addiction-induced problems, planning to control and reduce the number of drug addicts and improving the prognosis of this disorder. Anxiety and depression are widely seen in all of the stages of drug addicts' lives, whether when they have overdosed or experiencing these symptoms during withdrawal (7). Among these anxiety disorders, phobia is associated with depres-

sion more frequently (8). Depression following withdrawal is not specific to opiates and it is frequently observed in other cases such as cigarette withdrawal (6). Depression is more important than other psychiatric disorders because depression-induced energy decrease and despair can affect drug addicts' motivation for drug withdrawal and treatment (9). As a result, methadone treatment is suggested for helping patients and alleviating their social health problems. This treatment influences addiction prognosis both directly and indirectly (8). Different treatments such as detoxification and maintenance procedures have been applied to date to treat addiction and the application of methadone for this purpose is very common (10). In these methods, methadone replaces the morphine covering the receptors of drug addicts. Therefore, morphine is supposedly removed from the receptors, carried in the bloodstream, defecated and replaced by methadone. Since methadone does not cause drug tolerance, drug-addicts do not suffer from the symptoms of withdrawal and psychological dependence on methadone after administration of the drug. Studies has also indicated that methadone can have anti-depression and antianxiety effects. The accepted average detoxification duration by this protocol is 3-4 weeks. In maintenance treatment, the amount of the drug will gradually increase until withdrawal symptoms disappear, or drug addicts' craving for the consumption of illegal drugs reaches its minimum. Maintenance treatment is provided for a long time, at least for several months, usually more than one year and sometimes lifelong, while the success of this method of treatment has been proven in many countries (11). For safe and efficient use, familiarity with three pharmacologic characteristics of methadone is of great importance. Firstly, methadone level in patients' blood gradually reaches its peak four hours after its consumption; secondly, its half-life is about 25 hours (1-3 days); lastly and most importantly, its therapeutic index is low, i.e. there is a small difference between its therapeutic and toxic levels. The same dose of methadone can have different effects on different individuals. Methadone is a narcotic analgesic drug with long-term effects and its first pass effect on the liver is very high (about 80%). Therefore, drug-abuser patients are required to understand its pharmacology because its concomitant consumption with other CNS attenuating substances and drugs is associated with serious risk of poisoning (12). Moreover, potential symptoms of poisoning must be considered more carefully during treatment. Study of different therapeutic procedures and selection of the fittest one is an effective way for eliminating this social issue. No study has been conducted on this subject in Iran until now.

2. Objectives

The aim of this study was to evaluate the effectiveness of methadone maintenance treatment in the reduction of anxiety and depression among drug-related prisoners of Ahvaz Karoon's prison.

3. Patients and Methods

The present clinical trial study was conducted on drug-related prisoners in Ahvaz Karoon's prison during the second six-month period of 2011. In our study, 100 drug-related prisoners with the symptoms of anxiety and depression according to the SCL-90-R were interviewed. Participants were divided into two equal groups of control and methadone treatment. Fifty methadone group prisoners filled out the questionnaire at the beginning of the study and six months after methadone therapy. Their individual scores were recorded afterwards. Similarly, 50 control group prisoners (without methadone or any other therapy) filled out the questionnaire at the beginning of the study and six months later. All prisoners included in this study were not in the withdrawal period and they have served time more than two weeks in the prison. Afterwards, the questionnaires and patients' demographic information were collected and analyzed statistically by SPSS 20. Descriptive analysis such as mean and standard deviation (SD) were used for data demonstration and analytic statistical tests such as T-test were used to study the relationship between variables. Results were presented in the form of mean and mean ± SD and their frequencies are presented in percent. Independent T-test was used for comparison between the case and the control group. Moreover, regression test was used for showing the relationship between treatment and its results such as age, treatment period and marital status. P-value less than 0.05 was considered significant.

4. Results

The present study investigated 100 male drug-addicts in Ahvaz Prison in two methadone treatment and control groups. The average ages of control and methadone groups were 42.24 ± 9.89 years and 42.30 ± 9.83 years, respectively. The age difference between groups was not significant (P = 0.96). In the non methadone group, 19 (38%), 18 (36%) and 13 (26%) were married, single and widowed, respectively. The difference between groups regarding marital status was not significant (P = 0.96). The difference between groups regarding depression in methadone group (0.67 ± 0.49) and control group (2.82 ± 0.67) was significant (P = 0.001). The relationship between depression and age (P = 0.80) and marital status (P = 0.61) was not significant. The difference between methadone (0.59 ± 0.24) and control (2.56 ± 0.38) groups regarding anxiety was significant (P = 0.001). The relationship between anxiety and marital status (P = 0.09) and age (P = 0.34) was not significant. The difference between somatization in methadone (0.70 ± 0.30) and control (2.69 ± 0.41) groups was significant (P = 0.001). The difference between obsession in methadone (0.51 ± 0.25) and control (2.78 ± 0.43) groups was significant (P = 0.001). The

Table 1. The Mean and Standard Deviation of Different Studied Groups in the Methadone and the Control Group (n = 50) [a]

Type of Groups	With Methadone Therapy	Without methadone Therapy	P Value
Intrapersonal problems	0.58 ± 0.46	2.54 ± 0.40	0.001
Hostility	0.61 ± 0.43	2.48 ± 0.52	0.001
Phobia	0.43 ± 0.27	2.83 ± 0.34	0.001
Mental breakdown	0.46 ± 0.36	2.21 ± 0.56	0.001
Psychoticism	0.40 ± 0.30	2.21 ± 0.54	0.001
Depression	0.67 ± 0.49	2.82 ± 0.67	0.001
Anxiety	0.59 ± 0.24	2.65 ± 0.38	0.001
Somatization	0.70 ± 0.30	2.69 ± 0.41	0.001
Obsession	0.51 ± 0.25	2.78 ± 0.43	0.001

[a] Data are presented as Mean ± SD.

difference between interpersonal problems in methadone (0.58 ± 0.46) and control (2.56 ± 0.46) groups was also significant (P = 0.001). Moreover, the difference between hostility in methadone (0.61 ± 0.43) and control (2.48 ± 0.52) groups was significant (P = 0.001). In addition, the difference between phobia in methadone (0.43 ± 0.27) and control (2.83 ± 0.34) groups was significant (P = 0.001). The difference between mental breakdown in methadone (0.46 ± 0.36) and control (2.12 ± 0.65) groups was significant (P = 0.001). The difference between psychotic reactions in methadone (0.40 ± 0.30) and control (2.12 ± 0.54) groups was significant (P = 0.001) (Table 1).

5. Discussion

The present study indicated that methadone treatment significantly decreases the depression and anxiety score of prisoners. The results of this study are consistent with those by the previous study, which showed that depression decreases significantly in drug addicts under methadone treatment. Poornaghash showed that although methadone decreased anxiety and depression in drug-addicts, the difference between methadone and control groups was not significant (13). Another study by Dean et al. in Australia, which compared buprenorphine and methadone for decreasing depression in drug addicts, indicated that both of these drugs decrease depression but the difference is not significant (11). Maremmani confirms the result of our study. This study compared methadone and buprenorphine for decreasing psychological problems in patients and showed that compared to buprenorphine, methadone significantly decreases psychological problems such as somatization, psychoticism and panic attacks in patients (14). Another study also noted that not only does methadone treatment treat addiction in heroin addicts, but it also reduces their mental problems significantly (15). The present study indicated that methadone maintenance treatment of bipolar patients is significantly associated with positive effects. It also significantly reduces anxiety and panic attacks in patients. Studies have shown that methadone maintenance therapy prevents the recurrence of psychiatric disorders in patients with different types of psychosis. The same studies have noted that psychosis symptoms return in these patients with the discontinuation of methadone. Other studies have indicated that methadone therapy was effective in schizophrenic patients who do not respond to traditional medicines. These studies have shown that adding a low-dose of antipsychotic drugs to methadone has been very useful in the treatment of patients and the side effects of these drugs such as dyskinesia has significantly decreased (16). These therapeutic effects are due to the anti-dopaminergic properties of methadone (17). This effect was proven by measuring the serum prolactin after the administration of methadone. The present study also indicated that psychotic symptoms were significantly less in the methadone group compared to the control group. The present study also showed a significant decrease in the varieties of hostility or paranoid thoughts in methadone prisoners, which is consistent with previous studies showing that methadone therapy decreases hostile behavior in patients (18).

In line with the progress in treatment and elimination of psychological symptoms such as depression, participation in treatment programs creates a positive self-attitude, increases self-esteem and the sense of mastery and adequacy, develops hope for the future and improves family relationships. These effects can provide patients with a different experience for overcoming difficulties and stress and enables them to use different methods for coming to terms with them.

However, our study was limited due to its relatively small size and single sex samples. Another limitation was that the study was conducted in a prison environment, which means the samples are not sufficiently diverse. Therefore, future studies are suggested to be conducted on larger sample sizes with both sexes in different medical centers of a city so that its results would be more generalizable than our study.

Our study showed that methadone is very effective in the alleviation of psychiatric disorders in drug addicts. It also indicated that methadone maintenance therapy improve patients' quality of life and keeps them in the mood stabilization stage. Considering the significant decrease in impulsive and aggressive behaviors and the improvement of intrapersonal relationships, patients can use different solutions for their problems and improve their living standards (14).

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