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## Comparison of the Efficacy of Methadone Maintenance Therapy vs. Narcotics Anonymous in the Treatment of Opioid Addiction: A 2-Year Survey

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**Abstract:** Despite evidence that methadone maintenance treatment (MMT) is effective for opioid dependence, it remains a controversial therapy which its effectiveness has been disputed. The aim of this study was to compare the effectiveness of MMT vs. narcotics anonymous (NA). This was a longitudinal follow-up study. A total of 600 patients were included. The patients' current opioid misuse was confirmed by rapid urine test. Three hundred cases were engaged in MMT and others in NA program. The patients were not randomized to conditions but the groups were balanced. The study protocol consisted of a basic interview with the patients. Follow-up visits were scheduled. The goal of the study was to compare the outcomes of two groups regarding the retention rate. The majority of clients were male in both groups. The median age was 34 years in MMT group and 30 years in NA group. The median duration of opioid misuse before beginning the treatment was 7 and 2 years in MMT and NA groups. Seventy-four percent and 84% of patients remain in treatments in MMT and NA groups, respectively. The mean number of days in treatment was 210 days in MMT group compared to 270 days in NA group. There was no significant difference between 2 groups in this regard. Our findings suggest the usefulness of MMT in reducing opioid misuse but it does not show a statistically significant superior effect on key outcomes, including retention in the treatment.

**Key words:** Abstinence, addiction, methadone maintenance therapy, narcotics anonymous, opioid misuse

### INTRODUCTION

Drug addiction is a complex illness that is characterized by an intense, uncontrollable compulsion for drug taking even when it results in devastating consequences. Generally, addicts do not want to accept treatment but once they decide to do so, they choose one of the methods like as opioid replacement therapy, or non opioid replacement therapy (Mattick *et al.*, 2009).

The most efficient treatment approaches for opioid dependency are the interventions which affect both biological and behavioral components (Kinlock *et al.*, 2007). In spite of effectiveness of the treatment modalities, previous studies showed that relapse is an unavoidable

phenomenon in the course of treatment of substance dependency (Anton *et al.*, 2009). Kinlock *et al.* (2007) reported that pharmacological treatments make only 20 to 50% of patients to remain abstinent during the first year of treatment.

Two types of treatment modalities which are frequently used for opioid addiction are opioid replacement therapies such as methadone maintenance therapy (MMT) and non-medication therapies like narcotics anonymous (NA) which consists of individual and group counseling based on 12-step and cognitive behavioral principles (<http://www.na.org>).

Previous studies showed the effectiveness of MMT for treatment of opioid dependency (Dolan *et al.*, 2003;

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Corsi *et al.*, 2009) and clearly demonstrated that this type of treatment reduces illicit opioid use more than other treatments (Sees *et al.*, 2000).

Another treatment modality is NA which is a non-profit, self-help group and non-medication program (<http://www.na.org>). The goal of NA is spiritual awakening in each addicted participant. In pursuit of this, each member of the group is encouraged to develop a religious or non-religious relationship with a "higher power" and believes on it (Moos and Moos, 2004). Previous research has demonstrated it has beneficial effects in decreasing substance misuse (Kristensen and Vederhus, 2005) and decreasing sexual HIV risk behaviors (Cooperman *et al.*, 2005).

In Iran, opium misuse has deep cultural root in the society. According to the increase in the rate of opioid misuse, its dependency has become a serious health and social problem which spreads disease, creates social complications, reduces family incomes, increases the rate of car crashes/accidents and escalates illegal activities (Rahimi-Movaghar *et al.*, 2005; Razzaghi *et al.*, 2006; Shadnia *et al.*, 2007; Majdzadeh *et al.*, 2009) or even makes burden of costs for the government to provide adequate antidotes (Nikfar *et al.*, 2011).

Based on governmental policy in the treatment of opioid addiction, yet methadone is one of the most widely used treatments for opioid dependency in Iran. Although based on researches, the MMT remains the best treatment for opioid addiction but its effectiveness has been disputed (Mattick *et al.*, 2009).

However, according to our best of knowledge, there are scant data in Iran about the effectiveness of MMT and NA in keeping opioid misuser drug free and helping the addicts to remain abstinent. The aim of this study was to investigate the effectiveness of MMT compared with NA in the treatment of opioid addiction.

## MATERIALS AND METHODS

This was a longitudinal follow-up study in order to compare the outcomes of two different modalities of treatment for opioid addiction. A total of 600 patients over 18 years of age were included in the study. All of them met criteria of opioid addiction based on DSM-IV and their current opioid misuse was confirmed by rapid urine test before the baseline assessment. None of the patients were engaged in any type of treatment when recruited for the study.

The patients were engaged in one of the two different modalities of treatment, 300 cases in MMT and others in NA program. The patients were not randomized to conditions but the groups were balanced based on

variables such as: history of hospital admission due to psychiatric problem(s), suicidal attempt, criminal problem(s) and family status.

The study protocol consisted of a basic interview of psychiatrists with the patients in the first session of the treatment to rule out any co-morbidity. Also the researchers spoke with all of the cases in the first visit in the clinic to describe the research process and assured them about the privacy of the results. Follow-up visits were scheduled at 3, 6, 9, 12, 18 and 24 months. In each visit, a personal interview was performed by psychiatrists to elicit detailed information regarding the patients' drug misuse and their behaviors. Also rapid urine test and blood test was performed in each visit to detect opioid and or other substance misuse like alcohol, benzodiazepines, barbiturates, cannabinoids and amphetamines. During the course of treatment a questionnaire that was designed for this study and consisted of questions about general and baseline demographic data, addiction history and treatment details was completed by the researchers.

Our goal was to compare the outcomes of two groups regarding the retention rate over the course of treatment. The researchers calculated the retention rate as the number of days a patient remained in treatment continuously from beginning to end of the treatment course. As in some instances the patients dropped out of treatment and then returned, we regarded the treatment as continuous in NA group if the clients not remained out of treatment for more than 2 weeks. In MMT group, the retention in the treatment was based on self-report of methadone use in the past 30 days.

As there was no randomization in the selection of the patients in 2 groups, the statistical analysis was performed on baseline as well as follow up data. Data were expressed as Mean $\pm$ SD for numeric variables and as frequency and percentage for categorical variables. Chi-square test and Fisher's exact test were used to analyze the categorical data. After test the normality of numerical variables, the Student's t-test was used to analysis for variables with normal distribution. The Mann-Whitney U test was used for non parametric variables.

The p-values of 0.05 or less were considered statistically significant. The study was approved by Ethic Committee of Shahid Beheshti University of Medical Sciences.

## RESULTS

A total of 600 opioid addict participants included in the study. The majority of clients were male (97.8% in MMT and 81.3% in NA groups). The median age in MMT

Table 1: Comparison of the patients according to demographic data in each group

Variable	MMT group (n = 300)	NA group (n = 300)
Sex (%)		
Male	97.8	81.3
Female	2.2	18.7
Age (year)	34 (18-63)	30 (24-53)
Occupation (%)		
Jobless	57	17
Paid work	43	83
Education level (%)		
Primary school	36	23
High school	60	66
Academic	4	11
Marital status (%)		
Single	30	40
Married	45	50
Separated/divorced (%)	25	10
Live with the family (%)	68	85
Duration of opioid misuse (year)	7 (1-30)	2 (1-24)
History of poly drug misuse (%)	84	69
Family history of substance misuse (%)	90	82

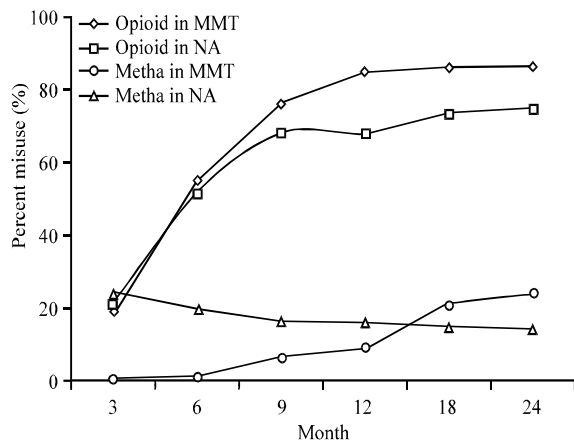


Fig. 1: Comparison between MMT and NA groups according to opioid and methamphetamine (Metha) misuse in different intervals during the study period

group was 34 years with a range of 18-63 years and in the NA group it was 30 years with a range of 24-53 years (Table 1).

On admission time, 57% of cases in MMT and 17% of clients in NA groups were jobless and others had either permanent or part time jobs. The level of education in most of the patients in each group was high school. Sixty-eight percent and 85% of patients in MMT and NA groups lived with their family. Most of the patients, 45 and 50% in MMT and NA groups, were married (Table 1).

The median duration of opioid misuse before beginning the treatment was 7 years (range: 1-30 years) in MMT group and 2 years (range: 1-24 years) in NA group. On admission time, all of the subjects in both groups had positive urine test for opioids. Eighty-four percent of

clients in MMT group and 69% of cases in NA group had the history of multidrug misuse. Also most of the patients in each group had the family history of substance misuse (90 and 82% in MMT and NA groups, respectively) (Table 1).

There were no significant differences between 2 groups according to age, sex, level of education, marital status and living with family, history of multidrug misuse and family history of substance misuse.

As some of the cases dropped out during the study, a total number of patients in the final analysis were 223 (74%) and 246 (84%) in the MMT and NA groups. The mean dose of methadone in MMT group was 80±10 mg day<sup>-1</sup>. The mean number of days in treatment was 210 days (range two weeks to twenty four months) in MMT group compared to 270 days (range three to twenty four months) in the NA group. There is no significant difference between 2 groups in this regard.

The rapid urine screen tests which were performed at 3, 6, 9, 12, 18 and 24 months intervals during the study period to detect the opioid misuse, showed 19, 55, 76, 84.8, 86 and 86.1%, positive result in MMT group and 21, 51.5, 68, 72, 73.6 and 74.8%, positive result in NA group (Fig. 1).

The incidence of methamphetamine abuse at 3, 6, 9, 12, 18 and 24 months intervals during the course of study was 0.5, 1.4, 6.4, 9, 20.7 and 23.9% in MMT group versus of 25, 19.8, 16.3, 16.1, 14.7 and 14%, in NA group (Fig. 1).

The prevalence of benzodiazepines misuse in the course of study was significantly lower among MMT group as compared to NA group (99% in the NA group versus 37% in the MMT group). There was no positive result in regard of alcohol, barbiturates and cocaine.

In 89% of clients in MMT group, the number of smoked cigarettes per day was significantly reduced during the first three months of methadone therapy (average of fifteen cigarettes/day reduced to five cigarettes/day) but 78% of cases in the NA group, showed no change.

## DISCUSSION

Some investigators showed methadone as an effective maintenance therapy for opioid dependency rather than other treatments which do not use opioid replacement therapy (Dolan *et al.*, 2003; Sees *et al.*, 2000). In another view, non-medication therapies like NA emphasize abstinence rather than maintenance on opioids and in their concept even medically prescribed methadone, is viewed as a mood altering drug that reinforces substance dependence and impedes recovery.

Despite these potential controversies in treatments' concept, our findings suggest that the MMT clients did

not differ from NA clients on key outcome variables, including retention rate, alcohol, barbiturate and cocaine misuse. A substantial proportion of participants in both groups did not return to illicit opioid use and of the clients in MMT and NA groups, many continued the treatment course and it is the same as other studies (Sorensen *et al.*, 2009).

The 24-month longitudinal study design allowed us to examine long-term treatment effects. Multiple assessments up to 24 months after admission, with follow-up rates, provide a longer-term view rather than most previous studies which compare MMT with non-medication treatments like NA (Chen *et al.*, 2009).

Across the follow-up periods, the proportion of participants who used illicit opioids increased steadily in both groups. Although we observed no significant difference between 2 groups according to illicit opioid use in the first year of treatment but after these times, the incidence of opioid misuse increased significantly in MMT group when compared to NA group which is contrary to previous study (Sees *et al.*, 2000).

Also we observed different patterns in regard of methamphetamine misuse in both groups. In MMT group it showed ascending and in NA group it had descending pattern, respectively.

One explanation about these differences about opioid and methamphetamine misuse in the participants of both groups could be the concept and philosophy of NA groups that they view the methadone and other prescribed drugs as a threat to individual and the system as a whole. Another reason could be the difference between patients in 2 groups according to their duration of opioid misuse.

The prevalence of benzodiazepines misuse and cigarette smoking was significantly lower among MMT group than NA group in the course of therapy. It can be due to sedative and antianxiety effects of methadone as an opioid agonist which decreases the need for the use of other sedatives like benzodiazepines.

Of course, a trend to addict to new drugs like tramadol (Soleymani *et al.*, 2011) is another issue that should be taken into consideration.

Finally, the results should be considered according to the limitations of this study. Participants were not randomly assigned to treatment conditions and their selection was based on self-selection. This fact may have an important role in the commitment of the participant to treatment program. The finding that the majority of clients were in treatment at follow-up interviews up to 24 months provides further evidence of their commitment to treatment modality.

## REFERENCES

- Anton, B., A. Salazar, A. Flores, M. Matus, R. Marin, J.A. Hernandez and P. Leff, 2009. Vaccines against morphine/heroin and its use as effective medication for preventing relapse to opiate addictive behaviors. *Hum. Vaccin.*, 5: 214-229.
- Chen, T., C.L. Masson, J.L. Sorensen and B. Greenberg, 2009. Residential treatment modifications: Adjunctive services to accommodate clients on methadone. *Am. J. Drug Alcohol Abuse.*, 35: 91-94.
- Cooperman, N.A., G.P. Falkin and C. Cleland, 2005. Changes in women's sexual risk behaviors after therapeutic community treatment. *AIDS Educ. Prev.*, 17: 157-169.
- Corsi, K.F., W.K. Lehman and R.E. Booth, 2009. The effect of methadone maintenance on positive outcomes for opiate injection drug users. *J. Subst. Abuse Treat.*, 37: 120-126.
- Dolan, K.A., J. Shearer, M. MacDonald, R.P. Mattick, W. Hall and A. Wodak, 2003. A randomized controlled trial of methadone maintenance treatment versus wait list control in an Australian prison system. *Drug Alcohol Depend.*, 72: 59-65.
- Kinlock, T.W., M.S. Gordon, R.P. Schwartz, K. O'Grady, T.T. Fitzgerald and M. Wilson, 2007. A randomized clinical trial of methadone maintenance for prisoners: Results at 1 month post release. *Drug Alcohol Depend.*, 91: 220-227.
- Kristensen, O. and J.K. Vederhus, 2005. Self-help programs in drug addiction therapy. *Tidsskr Nor Laegeforen.*, 125: 2798-2801.
- Majdzadeh, R., A. Feiz-Zadeh, Z. Rajabpour, A. Motevalian, M. Hosseini, M. Abdollahi and P. Ghadirian, 2009. Opium consumption and the risk of traffic injuries in regular users: A case-crossover study in an emergency department. *Traffic Inj. Prev.*, 10: 325-329.
- Mattick, R.P., C. Breen, J. Kimber and M. Davoli, 2009. Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence (Review). *Cochrane Database Syst. Rev.*, 8: CD002209.
- Moos, R.H. and B.S. Moos, 2004. Long-term influence of duration and frequency of participation in Alcoholics Anonymous on individuals with alcohol use disorders. *J. Consult. Clin. Psychol.*, 72: 81-90.
- Nikfar, S., M. Khatibi, A. Abdollahi-Asl and M. Abdollahi, 2011. Cost and utilization study of antidotes: An Iranian experience. *Int. J. Pharmacol.*, 7: 46-49.

- Razzaghi, E.M., A.R. Movaghar, T.C. Green and K. Khoshnood, 2006. Profiles of risk: A qualitative study of injecting drug users in Tehran, Iran. *Harm Reduct. J.*, 3: 12-20.
- Rahimi-Movaghar, A., A. Farhoudian, R. Rad-Goodarzi, V. Sharifi and M. Yunesian, 2005. A survey on the changes in drug use and its related factors in the survivors after Bam earthquake. Final Report, Tehran University of Medical Sciences and United Nations Office on Drugs and Crime. <http://www.unodc.org/pdf/iran/publications/Final-English%20report-survey-bam.pdf>
- Sees, K.L., K.L. Delucchi, C. Masson, A. Rosen and H.W. Clark *et al.*, 2000. Methadone maintenance vs. 180-day psychosocially enriched detoxification for treatment of opioid dependence: A randomized controlled trial. *J. Amer. Med. Assoc.*, 283: 1303-1310.
- Shadnia, S., M.R. Faiaz-Noori, A. Pajoumand, H. Talaie, A. Khoshkar, Sanaz Vosough-Ghanbari and M. Abdollahi, 2007. A case report of opium body packer; review of the treatment protocols and mechanisms of poisoning. *Toxicol. Mech. Methods*, 17: 205-214.
- Soleymani, F., G. Shalviri and M. Abdollahi, 2011. Pattern of use and adverse drug reactions of tramadol: A review of 336,610,664 insured prescriptions during 5 years. *Int. J. Pharmacol.*, 7: 757-760.
- Sorensen, J.L., S. Andrews, K.L. Delucchi, B. Greenberg, J. Guydish, C.L. Masson and M. Shopshire, 2009. Methadone patients in the therapeutic community: A test of equivalency. *Drug Alcohol. Depend.*, 100: 100-106.