



Trends in  
**Medical Research**

ISSN 1819-3587



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## A Comparison of Buprenorphine and Methadone Treatment of Heroine Dependency

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**Abstract:** At the present time heroine dependency is treated by methadone. In order to determine the effectiveness of another medicine named buprenorphine, an interventional study has been carried out. In this interventional study of 70 patients, we compared buprenorphine (2 mg) and low dose (20 mg) methadone as treatment for heroine dependence. Buprenorphine and methadone were administered daily for 15 days. There were 35 patients in each group. Comparison between groups for withdrawal sign and symptoms showed no significant differences. As compared with low-dose methadone and buprenorphine, it was shown that buprenorphine is a suitable treatment fore heroine addiction in term of decreased withdrawal sign and symptoms.

**Key words:** Buprenorphine, methadone, heroine, addiction

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### Introduction

Opioid dependence is an important national health problem, with an estimated 980000 long-term users of heroine in the United States (Rolley and Pharm, 2000). Progress in treating opiate addiction with medications has also been made. Several approaches have been developed to detoxifying opiate dependent patient. These include slow methadone withdrawal, therapy and buprenorphine detoxification. An advantage of buprenorphine, along acting partial opioid agonist/antagonist, is that it partially mitigates withdrawal symptoms and signs (Susan and Thomas, 1999). Methadone is a full agonist of opioid receptor with half-life of about 18 hours. It is metabolized in liver and excreted via kidneys (Shahramian *et al.*, 2004; Blasing and Hers, 2000).

Buprenorphine is a partial agonist of opioid receptors with half-life of about 1.2-7.2 h. It is metabolized in liver and excreted through kidneys (Blasing and Hers, 2000; Busquets and Ventayol, 2000). Both drugs have a high absorbability through intra venous and oral route and they reaches high blood concentration very quickly (Busquets and Ventayol, 2000). Controlled studies of methadone (Newman and Whitehill, 1979; Johnson and Jafee, 1992) and buprenorphine (Schottenfeld and Pakes, 1997; Ling and Charuvastrra, 1998) have documented their dose related efficacy in terms of retaining patients in treatment and reducing illicit opioid use. A clinical advantage of buprenorphine is the option of less-than-daily doses, which is made possible in the case of buprenorphine by the long half-lives of its active metabolites (Walsh and Preston, 1995; Walsh and June, 1995).

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Several controlled trials have compared the efficacy of buprenorphine (Johnson and Jaffe, 1992; Schottenfeld and Pakes, 1997; Cowan *et al.*, 1990) with the methadone. We compared the buprenorphine and methadone as treatment of heroine dependence.

### **Materials and Methods**

Seventy patients participate in this randomized, controlled study with two treatment groups. The eligibility criteria were an age of 20 to 30 years, diagnosis of heroine dependence according to the criteria of the Diagnostic and Statistical Manual of Mental Disorder, fourth edition, evidence of recent opioid use on toxicologic screening, the absence of serious medical or psychiatric illness requiring long-term medication. The study was approved by the local institutional review board and all patients provided written informed consent. Patient enrolled between April 2005 and August 2005. They were stratified according to the following variable: age, current other opioid use, marital status. They were randomly assigned to one of two treatment groups including 35 patients each: buprenorphine and low dose methadone.

Randomization occurred on the day of enrollment the patients and clinic staffs were unaware of treatment assignments and medication doses. The low dose methadone group (the control group) received a fixed dose of 20 mg and the buprenorphine group (the case group) received a fixed dose of 2 mg daily for 15 days. In duration of study the patient were kept under observation for appearance of following withdrawal symptom and signs: Anorexia, abdominal pain, insomnia, bone pain, mydriasis, tendency to use drug again, sweating, rhinorrhea, vomiting, restlessness, weakness, pulse rate, respiratory rate, blood pressure and body weight. In addition patients evaluated in three days after completing buprenorphine and methadone administration. We used for statistical analysis t-test and  $p < 0.001$  were showed that the findings significant.

### **Results and Discussion**

There were no significant differences between groups in demographic characteristics or signification variables (Table 1).

Patients were enrolled between April 2005 and August 2005. There were significant differences in study retention among the two groups. There were no significant differences in observation of withdrawal symptoms and signs; in during administration between groups but 3 days after completing administration buprenorphine was significantly better than methadone (Table 2).

Buprenorphine was effective in treating heroin dependence. The percentage of patients showed withdrawal syndrome compared favorably with rates reported elsewhere for this medication (Walsh and Preston, 1995; Walsh and June, 1995; Cowan *et al.*, 1990). Buprenorphine has a unique pharmacology that has suggested its use for the clinical management of heroin dependent individuals. Many formal controlled studies have shown that it gives comparable results to methadone treatment (Blasing and Hers, 2000).

Most of the development and evaluation research on buprenorphine has based on daily doses. Our study used similar doses and found same results. Patient on low dose methadone report wide range of side effects, especially during early days when their daily dose of methadone is being stabilized. In new orleans, for example, William (1972) gave 209 patients on methadone a check list of 33 assorted symptoms ranging from runny nose to less of appetite and asked them to check any from with they suffered as might be expected, this highly suggestive procedure produced abumper of reported

Table 1: The demographic characteristics of 70 patients

characteristic	Buprenorphine	Methadone
Age (year)	25±5	25±5
Education (year)	7±0.3	8±0.5
Married (%)	66	71
Employed (%)	25	30
Legal problem (%)	19	30
Alcohol	8.5±0.4	5±0.8
Other opiates	20±0.3	25±0.2

Table 2: Comparison between group according withdrawal symptoms and signs

Symptom or sign (%)	During administration		3 days after completing administration	
	Methadone	Buprenorphine	Methadone	Buprenorphine
Anorexia	15	20	14	22
Abdominal pain	10	45	18	30
Insomnia	8	15.5	17	50
Bone pain	15	26.5	20	70
Mydriasis	2.5	2.5	70	97
Tendency to use drug again	2.5	8	5	15
Sweating	10	18	17	23
Rhinorrhea	10	20	10	34
Vomiting	2.5	3.5	4	57
Restlessness	2.5	10	11	64
Weakness	12	12	12	25
Pulse rate increasing	0	0	0	24
Respiratory rate increasing	0	0	0	16
Blood pressure increasing	0	0	0	16

symptoms. Avram (1972) of Stanford from University carried out similar study of side effects in 206 methadone patients. This study of side effects but led to rather reassuring conclusions. Effects based buprenorphine or methadone has shown equivalent or better of buprenorphine reductions in heroine addiction. We fined better buprenorphine (2 mg) than low dose methadone (20 mg) but methadone dose may not be optimal. The significant differences between two groups may be are due to pharmacological differences because buprenorphine is along acting partial opioid agonist/antagonist, is that it partially mitigates withdrawal symptoms and signs (Susan and Thomas, 1999). Methadone is a full agonist of opioid receptor with half-life of about 18 h (Shahramian *et al.*, 2004).

In summary buprenorphine was more effective than low dose methadone in reducing withdrawal signs and symptoms in heroine dependence. According to this finding suggested the use of buprenorphine for heroine addiction treatment.

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