

Efficacy of treatment with buprenorphine, compared to methadone, in remission of opioid use disorder

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Abstract

Over the last decade, there has been a significant rise in deaths due to drug overdoses involving opioids. Opioids are highly addictive due to the rewarding effects they produce in the brain and body. Methadone, which is administered in a clinic, and buprenorphine, which can be taken at home, are the two leading treatment options for opioid use disorder. This review analyzes the efficacy of treatment with buprenorphine, compared to methadone, in remission of opioid use disorder.

Introduction

Overview

- ❖ In 2018, 10.3 million people misused prescription opioids, which led to the death of roughly 130 people per day.
- ❖ Opioids work by releasing dopamine in the brain.

Treatment

- ❖ Methadone is a full agonist, and must be administered through an IV in a clinic
- ❖ Buprenorphine is a partial agonist and can be taken orally at home
- ❖ Both cause euphoria, however buprenorphine has less potential for abuse due to a low ceiling for the euphoric effect.

Methods

Literature search

- ❖ Performed on October 23, 2019 using
 - > Pub Med
 - > Academic Search ultimate
- ❖ Search terms
 - > Buprenorphine AND methadone AND adults
- ❖ Inclusion criteria
 - > Clinical trials, humans, adult 19+, published within the last 5 years, therapeutic use
- ❖ Exclusion criteria
 - > Systemic reviews, meta-analysis, prenatal effects, drug interactions, financial effects
- ❖ This narrowed down the search to a total of seven articles

Results

- Mattick RP, Ali R, White JM, et al. Buprenorphine versus methadone maintenance therapy: a randomized double-blind trial with 405 opioid-dependent patients. *Addiction*. 2003 Apr;98(4):441-52.
 - ❖ RCT of 405 patients randomized to buprenorphine or methadone in a 13 week double blind trial.
- Otlashvili D, Pirilishvili G, Sikharulidze Z, et al. Methadone and buprenorphine-naloxone are effective in reducing illicit buprenorphine and other opioid use, and reducing HIV risk behavior—outcomes of a randomized trial. *Drug and alcohol dependence*. 2013 Dec 1;133(2):376-82.
 - ❖ RCT that measured time maintained in treatment of 80 participants taking either buprenorphine or methadone.
- Hser Y4, Saxon AJ, Huang D, et al. Treatment retention among patients randomized to buprenorphine/naloxone compared to methadone in a multi-site trial. *Addiction*. 2014 Jan;109(1):79-87.
 - ❖ Secondary analysis of 1269 examining characteristics associated with longer retention of treatment.
- Kamien JB, Branstetter SA, Amass L. Buprenorphine-naloxone versus methadone maintenance therapy: A randomised double-blind trial with opioid-dependent patients. *Heroin Addiction and Related Clinical Problems*. 2008 Dec 1;10(4):5-18.
 - ❖ RCT of 268 participants comparing buprenorphine to methadone in maintenance treatment of opioid dependence.
- Hser Y4, Evans E, Huang D, et al. Long-term outcomes after randomization to buprenorphine/naloxone versus methadone in a multi-site trial. *Addiction (Abingdon, England)*.
 - ❖ Secondary analysis of 1269 participants comparing the long-term outcomes of individuals randomly given either buprenorphine or methadone as treatment for opioid use disorder.
- Yarborough BJH, Stumbo SP, McCarty D, Mertens J, Weisner C, Green CA. Methadone, buprenorphine and preferences for opioid agonist treatment: A qualitative analysis. *Drug and alcohol dependence*.
 - ❖ Qualitative analysis of 283 participants comparing preferences in treatment of opioid dependence.
- Gryczynski J, Mitchell SG, Jaffe JH, et al. Retention in methadone and buprenorphine treatment among African Americans. *Journal of substance abuse treatment*.
 - ❖ RCT of 478 participants that evaluated treatment retention for buprenorphine with naloxone and methadone in the African American population in the real-world clinical setting.

Study	Treatment retention	Mortality Rates	Other illicit drug use	Reduction of opioid use
1	SM	NA	NA	NS
2	NS	NA	NA	NS
3	SM	NA	NS	SB
4	NS	NA	NS	NS
5	SM	NS	NA	SM
6	NA	NA	NA	NA
7	SM	NA	SB	NS

Key: SM = methadone showed significant difference, SB = buprenorphine showed significant difference (increased retention, reduction in mortality, reduction of illicit drug use, reduction of opioid use in general); NS = No significant difference between both drugs; NA = Not applicable

Discussion

Overview

- ❖ Four of the seven studies found methadone to be significantly more effective in increasing treatment retention times.
- ❖ Four of the seven studies also found that between the two treatment options, there was no significant reduction in opioid use in general.
- ❖ While methadone did induce a longer retention of treatment, these results indicate that since neither drug is more effective in the reduction of opioid usage in general, there may be other social determinants influencing time retained in treatment.
- ❖ It is clear that while buprenorphine may have earlier drop-out rates, eventually the retention curves stabilize and become comparable to that of methadone. Many of the studies have suggested that social determinants, and not the drug itself, are influencing the earlier drop-out rate of buprenorphine.

Limitations

- ❖ Overall, small sample sizes
- ❖ Minimal follow-up after the trial
- ❖ Relatively short length of the study

Future Research

- ❖ Larger sample sizes
- ❖ Analyze socioeconomic effects on receiving adequate treatment
- ❖ Ways to improve early drop off rates

Conclusion

Buprenorphine and methadone have both been prescribed as treatment of opioid withdrawal, but little evidence has been conducted to evaluate which drug is more beneficial. Research, as of today, has shown methadone increases time maintained in treatment, but not an overall significant decrease in opioid reduction.

The studies were limited by small sample size, short lengths and minimal follow-up after the study. Future research is necessary to determine what other factors are influencing the differences in treatment retention. With buprenorphine having a higher incidence of dropouts early on in the treatment, it is crucial to understand factors contributing to this difference.