

Review on Effect of Bupropion on Attenuates Methamphetamine Self-administration in Adult Male Rat

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Abstract

Introduction: Methamphetamine is a highly potent, addictive drug that is widely abused in many countries around the world. Methamphetamine produces a general state of well-being along with increased wakefulness, talkativeness, and physical activity and decreased appetite. Behavioral treatment programs have had some success in the treatment of methamphetamine addiction, yet many patients continue to relapse after repeatedly seeking treatment. Thus, pharmacotherapies treatments for methamphetamine addiction are being evaluated.

Bupropion is an atypical antidepressant with stimulant properties. This drug has been used off-label to treat methamphetamine addicts, thus prompting the need for systematic investigations of its efficacy.

Methods and Results: Male wistar rats, weighing 200–250 g (8 weeks old) at the start of the experiment. In the self-administration study, rats were surgically prepared with indwelling jugular catheters. After the surgery rats were trained to press a lever of methamphetamine reinforcement (0.05 mg/kg/injection) in operant boxes under baseline conditions. When responding stabilized, rats entered the acute testing phase. Each rat was tested with a unique order of vehicle, 10, 30, and 60 mg/kg bupropion. Each solution was administered IP 5 min before placement in the chamber for a regular self-administration session and each test was separated by at least 2 maintenance days of methamphetamine self-administration without drug pretreatment. Bupropion pretreatment appeared to decrease active lever responding. Consistent with the active lever data, rats treated with 60 mg/kg bupropion took significantly fewer total methamphetamine infusions in comparison to the other 2 groups. When Control rats (n=6) (i.e., those pretreated with saline in the previous phase) were given an acute injection of 30 mg/kg bupropion, lever pressing decreased.

Conclusions: Several questions remain about bupropion's impact during withdrawal, abstinence, and relapse in a preclinical setting. Research investigating these aspects of addiction will help provide a clearer picture on the effects of bupropion on methamphetamine self-administration in laboratory animals and methamphetamine abuse in humans.

Key words: methamphetamine, bupropion, self-administration, subject-rated drug effects, physiological drug effects

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