The selective dopamine D3 receptor antagonist, SR 21502, reduces reinstatement of methamphetamine seeking in rats

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Introduction

- The D3 receptor antagonist such as SR 21502 is suggested to reduce drug craving and aid in the reduction of relapse.
- The drug of abuse methamphetamine (meth) produces both reward and reinforcing effect in the brain (p<.05).
- This study tested the hypothesis that the dopamine D3 receptor antagonist, SR 21502, will reduce reinstatement of methamphetamine seeking.

Methods

IVSA
- methamphetamine self-administration under FR1
- active lever: meth 0.2 mg/kg/infusion
- 15 training sessions

Extinction
- active lever: no consequences
- absence of drug or drug cues
- 15 sessions

Reinstatement
- rats pre-treated with one of the SR 21502 doses (0, 0.75, 7.5, 15 and 30mg/kg)
- cue-induced reinstatement or stress-induced reinstatement of meth seeking
- 2 light/pump cue presentations or electric-foot shock with cues presentations
- active lever presses reinforced by drug cues or presence of stress

Results

Figure 1: Methamphetamine infusions, active and inactive lever presses across 15 self-administration session.

Figure 2: Active lever presses during extinction.

Figure 3: Left Graph: Active and inactive lever presses during the last 3 days of extinction. Right graph: Active and inactive lever presses during the cue-induced reinstatement test (drug-seeking/relapse).

Figure 4: Active lever presses during extinction.

- A significant SR 21502 dose-related reduction in cue-induced reinstatement of lever pressing was seen at 15mg and 30mg.
- This procedure produced a robust reinstatement effect; SR 21502 reduced active lever presses.

Conclusions

- Our findings suggest that dopamine D3 antagonist SR 21502 has the potential to be an effective pharmacotherapeutic agent for methamphetamine relapse.

References

