Bupropion for the treatment of amphetamine-type stimulant use disorder: A systematic review and meta-analysis of placebo-controlled randomized clinical trials

Category: Oral Presentation

Abstract Body

Background: Evidence is scarce on efficacy and safety of bupropion for treatment of amphetamine-type stimulant use disorder (ATSUD) (such as amphetamine/methamphetamine). In this meta-analysis (PROSPERO-ID: CRD42022362962), we reported effect estimates of various outcomes, pooled from placebo-controlled randomized trials examining efficacy and safety of bupropion (doses 300-450 mg per day) for ATSUD treatment, and conducted various subgroup analyses.

Method: Main electronic databases were searched for records published until October 31st, 2022, including MEDLINE, CINAHL, PsycINFO, EBM Reviews, EMBASE, PubMed, Web of Science, in addition to clinical trial registries. Study inclusion criteria were randomized clinical trials comparing bupropion to placebo in ATSUD, diagnosed using DSM IV or DSM-5. Assessment of bias risk and quality of evidence were conducted using Cochrane RoB2 tool and GRADE evidence certainty assessment. We included following outcomes: amphetamine-type stimulant (ATS) use by urinalysis (UA), retention in treatment, treatment adherence, craving (week 4 and end-of- treatment), addiction and depression severity, dropout following adverse events (AE), and serious AEs. For each outcome, the random-effect meta-analysis was conducted on pooled results, using standardized mean difference (SMD) for continuous outcomes and risk ratio (RR) and risk difference (RD) for dichotomous outcomes.

Results: Eight placebo-controlled trials (N=1239 participants; with adjunctive naltrexone in one trial) were included. Participants were 17-42 years old on average, and 42-100% were male. Bupropion compared to placebo was associated with reduced ATS use (RR: 0.90; 95%CI: 0.84, 0.96), reduced end-of- treatment craving (SMD: -0.38; 95%CI: -0.63, -0.13), and reduced adherence (RR: 0.91; 95%CI: 0.84, 0.99). Subgroup analysis showed greater reduction in ATS use with trials of longer durations (12 weeks) (RR: 0.85; 95%CI: 0.78, 0.93), and greater reduction in end-of- treatment craving with inclusion of studies with unspecified (all) ATS use frequency (SMD: -0.46; 95%CI: -0.70, -0.22) and in studies conducted in males (SMD: -1.26; 9%%CI: -1.87, -0.65). Evidence quality varied between very low (ATS use and craving) and high (retention).

Conclusion: Bupropion showed significant reduction in ATS use by UA and end-of- treatment craving reduction; specifically in male-only studies and with longer treatment. Our results may help inform future guidelines for ATSUD treatment.

Key Words

- Novel Therapeutics
- Pharmacologic Interventions
- Stimulants
- Substance Use Disorder (general)

Learning Objective # 1
Update my knowledge on different subjects in the addiction medicine and receive feedback on my research.

Learning Objective # 2
Share my research results with other researchers: bupropion as a potential treatment for stimulant use disorders

Reference # 1
Siefried, K. J., Acheson, L. S., Lintzeris, N., & Ezard, N. (2020). Pharmacological Treatment of Methamphetamine/Amphetamine Dependence: A Systematic Review. CNS Drugs, 34(4), 337-365. https://doi.org/10.1007/s40263-020-00711-x

Reference # 2
Shoptaw, S., Heinzerling, K. G., Rotheram-Fuller, E., Steward, T., Wang, J., Swanson, A. N., De La Garza, R., Newton, T., & Ling, W. (2008). Randomized, placebo-controlled trial of bupropion for the treatment of methamphetamine dependence. Drug Alcohol Depend, 96(3), 222-232. https://doi.org/10.1016/j.drugalcdep.2008.03.010