Abstract

Objectives:
This meta-analysis aims to study the effects of atomoxetine and methylphenidate on heart rate (HR), systolic blood pressure (SBP), and a number of adverse cardiac events on patients receiving treatment for attention-deficit hyperactive disorder (ADHD) in comparison to placebo and between atomoxetine and methylphenidate.

Methods:
We searched the following databases: PubMed, EMBASE, and ScienceDirect. Meta-analysis was performed on studies that examined the relationships between methylphenidate or atomoxetine and HR, SBP, as well as a number of adverse cardiac events. These studies were either placebo-controlled or comparison studies between methylphenidate and atomoxetine. Meta-regression identified patient- and treatment-related factors that may contribute to heterogeneity.

Results:
Twenty-two studies were included and the total number of participants was 46,107. Children/adolescents and adults treated with methylphenidate had more significant increases in post- vs. pre-treatment HR (p < 0.001) and SBP (p < 0.001) than those treated by placebo. Children and adolescents treated with atomoxetine had more significant increases post- vs. pre-treatment HR (p = 0.025) and SBP (p < 0.001) than those treated with methylphenidate. Meta-regression revealed mean age of participants, mean dose, and duration of atomoxetine and methylphenidate as significant moderators that explained heterogeneity. There were no differences in the number of adverse cardiac events between participants with methylphenidate treatment and placebo or atomoxetine.

CONCLUSIONS:
Children/adolescents and adults treated with methylphenidate resulted in significant increases in post- vs. pre-treatment HR and SBP as compared to placebo. Similarly, children and adolescents treated with atomoxetine had significant increases in post- vs. pre-treatment HR and SBP than those treated with methylphenidate. These findings have potential implications for continuous monitoring of HR and SBP throughout the course of treatment although the risk for adverse cardiac events were insignificant.