Comparative efficacy of methylphenidate and atomoxetine in the treatment of attention deficit hyperactivity disorder in children and adolescents: A systematic review and meta-analysis

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Abstract

Background:
The aim of this study was to directly compare efficacy of atomoxetine and methylphenidate in treatment of children and adolescents 6-18 years.

Methods:
All published, randomized, open label or double blind trials, comparing the efficacy of methylphenidate with atomoxetine in treatment of children diagnosed with ADHD, using DSM-IV criteria were included in this study; ADHD Rating Scale–IV–Parent Version: Investigator Administered and Scored (ADHDRS) scores was used. The standardized mean difference (SMD) was used as a measure of effect size.

Results:
Eleven studies were included with a total of 2,772 participants. The meta-analysis did not find a significant difference in the efficacy between methylphenidate and atomoxetine (SMD= 0.09, 95% CI -0.06, 0.25) (Z= 1.18, p= 0.24). Sub group analysis showed a significant standardized mean difference favoring OROS methylphenidate (SMD= 0.31, 95% CI 0.16, 0.47 (Z= 3.91, p< 0.0001); immediate release methylphenidate was not superior to atomoxetine (SMD= -0.05, 95% CI -0.20, 0.10) (Z= 0.68, p= 0.49). Open label trials did not make a difference in the standardized mean difference (SMD= 0.10, 95% CI -0.02, 0.23) (Z= 1.17, p= 0.09). There was significant heterogeneity among the studies (p= 0.003, I2= 63%). Subgroup analysis demonstrated that heterogeneity was because of the open label trials (p= 0.009, I2= 79%).

Conclusion:
Atomoxetine and methylphenidate showed comparable efficacy in the treatment of children and adolescents with ADHD. However, Osmotic (Controlled) Release Oral (Delivery) System (OROS) methylphenidate is more effective than atomoxetine in treatment of ADHD in children and adolescents that is suggested as a first-line treatment in ADHD. Moreover, comparing the immediate release (IR) methylphenidate to atomoxetine did not lead to the benefit of IR methylphenidate.