Pharmacological treatment for attention deficit hyperactivity disorder (ADHD) in children with comorbid tic disorders

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Abstract

Background
This is an update of the original Cochrane Review published in Issue 4, 2011.

Attention deficit hyperactivity disorder (ADHD) is the most prevalent of the comorbid psychiatric disorders that complicate tic disorders. Medications commonly used to treat ADHD symptoms include stimulants such as methylphenidate and amphetamine; non-stimulants, such as atomoxetine; tricyclic antidepressants; and alpha agonists. Alpha agonists are also used as a treatment for tics. Due to the impact of ADHD symptoms on the child with tic disorder, treatment of ADHD is often of greater priority than the medical management of tics. However, for many decades, clinicians have been reluctant to use stimulants to treat children with ADHD and tics for fear of worsening their tics.

Objectives
To assess the effects of pharmacological treatments for ADHD in children with comorbid tic disorders on symptoms of ADHD and tics.

Search methods
In September 2017, we searched CENTRAL, MEDLINE, Embase, and 12 other databases. We also searched two trial registers and contacted experts in the field for any ongoing or unpublished studies.

Selection criteria
We included randomized, double-blind, controlled trials of any pharmacological treatment for ADHD used specifically in children with comorbid tic disorders. We included both parallel-group and cross-over study designs.

Data collection and analysis
We used standard methodological procedures of Cochrane, in that two review authors independently selected studies, extracted data using standardized forms, assessed risk of bias, and graded the overall quality of the evidence by using the GRADE approach.

Main results
We included eight randomized controlled trials (four of which were cross-over trials) with 510 participants (443 boys, 67 girls) in this review. Participants in these studies were children with both ADHD and a chronic tic disorder. All studies took place in the USA and ranged from three to 22 weeks in duration. Five of the eight studies were funded by charitable organizations or government agencies, or both. One study was funded by the drug manufacturer. The other two studies did not specify the source of funding. Risk of bias of included studies was low for blinding; low or unclear for random sequence generation, allocation concealment, and attrition bias; and low or high for selective outcome reporting. We were unable to combine any of the studies in a meta-analysis due to important clinical heterogeneity and unit-of-analysis issues.

Several of the trials assessed multiple agents. Medications assessed included methylphenidate, clonidine, desipramine, dextroamphetamine, guanfacine, atomoxetine, and deprenyl. There was low-quality evidence for methylphenidate, atomoxetine, and clonidine, and very low-quality evidence for desipramine, dextroamphetamine, guanfacine and deprenyl in the treatment of ADHD in children with tics. All studies, with the exception of a study using deprenyl, reported improvement in symptoms of ADHD. Tic symptoms also improved in children treated with guanfacine, desipramine, methylphenidate, clonidine, and a combination of methylphenidate and clonidine. In one study, tics limited further dosage increases of methylphenidate. High-dose dextroamphetamine appeared to worsen tics in one study, although the length of this study was limited to three weeks. There was appetite suppression or weight loss in association with methylphenidate, dextroamphetamine, atomoxetine, and desipramine. There was insomnia associated with methylphenidate and dextroamphetamine, and sedation associated with clonidine.

Authors’ conclusions
Following an updated search of potentially relevant studies, we found no new studies that matched our inclusion criteria and thus our conclusions have not changed.

Methylphenidate, clonidine, guanfacine, desipramine, and atomoxetine appear to reduce ADHD symptoms in children with tics though the quality of the available evidence was low to very low. Although stimulants have not been shown to worsen tics in most people with tic disorders, they may, nonetheless, exacerbate tics in individual cases. In these instances, treatment with alpha agonists or atomoxetine may be an alternative. Although there is evidence that desipramine may improve tics and ADHD in children, safety concerns will likely continue to limit its use in this population.