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Pharmacotherapy for Impulsivity-hyperactivity behaviors in autism spectrum disorder.

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Abstract

Hyperactivity is a shared behavior with ASD and Attention Deficit Hyperactivity Disorder (ADHD). Medications such as Methylphenidate (MPH) and 2-a adrenergic receptor agonists are used to modify hyperactivity behavior in ADHD and thus have been used as management in ASD. A review of literature was done to evaluate the use of medications typically used for ADHD in the use of ASD. The databases searched included PubMed, PsycINFO, Cochrane, and Clinical Key. After reviewing the literature, it was found that both MPH and 2-a adrenergic receptor agonist have a potential role in pharmacotherapy for ASD. MPH may be slightly more effective at reducing hyperactivity impulsivity behaviors than 2-a adrenergic receptor agonist, however the side effect profile in MPH has led to more discontinuations over 2-a adrenergic receptor agonists. More studies would need to be conducted to validate the findings of this review.

Keywords: ASD, ADHD, PDD-NOS, Asperger syndrome, autistic disorder, Hyperactivity, Stimulants, MPH, Guanfacine, Clonidine

Literature Review

Methylphenidate as a treatment for impulsivity-hyperactivity in ASD

- 8 out of 13 children were deemed responders to MPH (Harden, Johnson & Lubetsky, 2000).
- Accrued children were compared to the control by RUPP. “Our response rate of 49% is less than the previously described response rates of 70% to 80% seen in typically developing children with ADHD”
- MPH was found to be superior to placebo at reducing hyperactivity (Quintana et al., 1995).

Methylphenidate as a treatment for impulsivity-hyperactivity in ADHD

- 80% of the 314 subjects were deemed responders to MPH (Greenhill, Findling & Swanson, 2002).
- 19 of the 80 subjects (23.8%) were deemed as “responder” (Jaselskis, Cook, Fletcher & Leventhal, 1992).
- In no case did side effects lead to discontinuation of guanfacine in this study (Posey, Puntney, Sasser, Kem & Mcdougle, 2004).
- 16% of subjects withdrew due to adverse effects associated with guanfacine (Scibill et al., 2006).
- Causes of discontinuation of pharmacotherapy with a 2-a receptor agonist in ADHD

- The total rate of discontinuation due to side effects in this trial was GXR of 7.4% and placebo at 7.6% (Sallee et al., 2009).
- There were nine participants that ultimately withdrew from the study due to adverse effects (Wilens et al., 2015).

Research Questions

1. In children with ASD, are psychostimulants, such as MPH as effective at reducing impulsivity-hyperactivity behaviors as compared to children with ADHD according to teacher and parent reports?
2. In children with ASD, are 2-a adrenergic receptor agonists, such as clonidine and guanfacine, more effective at reducing impulsivity-hyperactivity behaviors as compared to psychostimulants such as MPH, according to teacher and parent reports?
3. Are the rates of discontinuation of pharmacotherapy in children with ASD higher in treatment with MPH vs clonidine or guanfacine?

Literature Review, cont.

Causes for discontinuation of pharmacotherapy with methylphenidate in ADHD

- Of the 314 children in the study, two discontinued the treatment due to adverse events (Greenhill, Findling & Swanson, 2002).
- Of the 220 subject, there was one serious adverse event requiring discontinuation in which a subject threatened suicide (Wilens, et al., 2016).

Causes for discontinuation of pharmacotherapy with a 2-a receptor agonist in ADHD

- None of the subjects discontinued use of clonidine during the trial due to adverse side effects (Jaselskis, Cook, Fletcher & Leventhal, 1992).
- In no case did side effects lead to discontinuation of guanfacine in this study (Posey, Puntney, Sasser, Kem & Mcdougle, 2004).

Discussion

- The number of subjects in the ASD studies ranged from 9-13 compared to the ADHD studies which ranged from 220-314.
- The response rate to MPH in the ASD group ranged from 49-61%, whereas, responders in the ADHD population ranged from 52-81%.
- MPH and a 2-a adrenergic receptor agonists were both found to be statistically significant at modifying impulsivity-hyperactivity behavior in children with Autism.
- The most common reasons for discontinuation of MPH were irritability, crying, tantrums, skin picking and aggression.
- The most common reasons for discontinuations of 2-a adrenergic receptor agonists were excessive fatigue, somnolence, irritability and emotional lability.

Applicability to Clinical Practice

- Behaviors associated with Autism such as hyperactivity and impulsivity are often detrimental in various situations of life.
- The increasing incidence of autism is evidence that continued investigation and evaluation of the most efficacious medical management is needed to meet the needs of this increasing population.
- By identifying the most efficient pharmacological therapy for these behaviors, providers can help to prescribe an appropriate medication regimen to improve quality of life for both patients and caregivers.

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References


FIG 1. Global response to guanfacine in RfS subjects with pervasive developmental disorder based on the Clinical Global Impressions Global Improvement score.