Children's Yale–Brown Obsessive Compulsive Scale in Autism Spectrum Disorder: Component Structure and Correlates of Symptom Checklist

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Objective: Repetitive behaviors in autism spectrum disorders (ASD) range from motor stereotypy to immersion in restricted interests. The modified Children's Yale–Brown Obsessive Compulsive Scale for children with autism spectrum disorder (CYBOCS-ASD) includes a Symptom Checklist (behavior present or absent) and 5 severity scales (Time Spent, Interference, Distress, Resistance and Control). **Method:** We assembled CYBOCS-ASD data from 3 Research Units on Pediatric Psychopharmacology Autism Network trials to explore the component structure of repetitive behaviors in children with ASD. Raters trained to reliability conducted the CYBOCS-ASD in 272 medication-free subjects. Fifteen Symptom Checklist items were endorsed for less than 5% of the sample and were dropped. Principal component analysis was used to explore the clustering of 23 checklist items. Component scores computed for each subject were correlated with other measures. We also examined the distribution of severity scales. **Results:** The subjects (229 boys and 43 girls; mean age = 7.8 ± 2.6 years) met criteria for an ASD; half were intellectually disabled. The PCA resulted in a 5-component solution to classify repetitive behaviors (34.4% of the variance): hoarding and ritualistic behavior; sensory and arranging behavior; sameness and self-injurious behavior; stereotypy; restricted interests. Sensory and arranging and stereotypy components were associated with lower adaptive functioning (Pearson r = 0.2–0.3; $p < .003$). The resistance scale showed little variation, with more than 60% of the sample with the highest score. **Conclusions:** Rarely endorsed items can be dropped from the Checklist. The resistance item does not appear to be relevant for children with ASD. J. Am. Acad. Child Adolesc. Psychiatry, 2014;53(1):97–107. **Key Words:** autism spectrum disorder, clinical trials, outcome measures, repetitive behavior

Autism spectrum disorder (ASD) is a chronic condition of early childhood onset that is defined by impaired social interaction and social communication as well as repetitive behavior and restricted interests.[1] Current prevalence estimates for ASD range from 0.6% to 1.3% of school-aged children in the United States.[2,3] Two medications, risperidone and aripiprazole, are currently approved by the US Food and Drug Administration for treating irritability (tantrums, aggression, and self-injury) in children with more narrowly defined autistic disorder. Empirically supported treatments for impaired social interaction or repetitive behavior are less well established and are hampered by incomplete consensus on outcome measurement.

Repetitive behavior is a defining feature of other psychiatric disorders including Tourette syndrome (TS) and obsessive-compulsive disorder (OCD). Tics in TS range from eye blinking, head jerking, and throat clearing to more complex

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touching habits and blurting out words or parts of words.[4] In OCD, children may show handwashing, checking or elaborate rituals to prevent harm, or touching in patterns to achieve a sense of completion.[5,6]

Children with ASD may exhibit stereotypic motor behavior such as hand flapping, rocking, or spinning objects, or more complex behaviors such as repeatedly watching particular video segments.[7,8] Several investigators have described "higher"- and "lower"-order repetitive behaviors.[9-12] In this model, higher-order behaviors reflect insistence on routines and more purposeful behavior (watching the same video), whereas lower-order behaviors include motor stereotypies or sensory-motor behavior such as spinning an object. Other investigators propose circumscribed interests as a third domain.[11] The behavioral correlates of circumscribed interests might include reading books on a certain subject or talking about that topic (e.g., mechanical devices) to the exclusion of other topics.[13] In contrast to the unwanted repetitive behaviors in TS and OCD, children with ASD may not struggle against their repetitive behaviors. Indeed, for many children with ASD, the repetitive behavior is a preferred activity. For some children, frustration, protest, and tantrums may occur when the child is asked to stop the behavior.[7,13]

In preparation for multisite trials in ASD, the Research Units on Pediatric Psychopharmacology (RUPP) Autism Network modified the Children's Yale–Brown Obsessive Compulsive Scale (CYBOCS).[7] The original CYBOCS is a clinician-rated interview designed to measure current symptom severity in youth with OCD.[14] It contains separate checklists for obsessions and compulsions, 5 severity items for obsessions and 5 for compulsions. The severity items are scored from 0 (not present) to 4 (extreme), yielding an Obsessions score of 0 to 20, a Compulsions score of 0 to 20, and a total of 0 to 40. Given the challenge of ascertaining obsessions in individuals with ASD, the modified CYBOCS for ASD retains only the 5 compulsion items.[7] We also added items to the compulsions checklist and made minor adjustments to the severity anchor points for use in children with ASD. The revised instrumnt has demonstrated reliability and validity and has also demonstrated sensitivity to change.[7,15]

The purpose of this study is to extend our previous work on adapting the original CYBOCS as an outcome measure in pediatric clinical trials in ASD and other developmental disorders. To this end, we examined the component structure of the compulsions checklist and the distribution of severity scores on the CYBOCS-ASD in a sample of well-characterized children with ASD.

METHOD

Participants and Setting

A total of 291 subjects participated in 1 of 3 multisite randomized trials conducted by the RUPP Autism Network.[16-19] Baseline CYBOCS-ASD checklists were missing or illegible for 19 subjects. Thus, the study sample included 272 subjects (229 boys and 43 girls; aged 4 through 17 years). The institutional review board at each site approved the studies and written informed consent was obtained from parents or legal guardians before data collection. Assent was obtained from children who were able to understand the details of their involvement.

Eligible subjects at baseline were healthy, had a mental age of 18 months or higher, were free of a psychiatric condition requiring another treatment and were medication free for at least 2 weeks (1 month for fluoxetine or antipsychotic medications). In the first trial (RUPP I), 101 children and adolescents with autistic disorder (aged 5–17 years) accompanied by serious behavioral problems (Aberrant Behavior Checklist [ABC] Irritability subscale $\geq$18) were randomly assigned to risperidone or placebo for 8 weeks (RUPP Autism Network, 2002). RUPP II compared 3 doses of methylphenidate to placebo in 66 children (aged 5–14 years) with autistic disorder, Asperger's disorder, or pervasive developmental disorder not otherwise specified (PDD-NOS) plus hyperactivity in a 4-week crossover trial (RUPP Autism Network, 2005).[17] In the third trial (RUPP III), 124 children (aged 4.5–13 years) with ASD and serious behavioral problems (ABC Irritability subscale $\geq$18) were randomly assigned to risperidone only or risperidone plus parent training for 6 months.[18,19]

Procedures

The clinical assessments were conducted by experienced multidisciplinary teams and included complete medical, developmental, and psychiatric histories, tests of IQ and adaptive functioning, as well as parent interviews and questionnaires.[16-19] The ASD diagnosis was based on clinical interview and observation and were supported by the Autism Diagnostic Interview–Revised.[20]

Measures

Intellectual Functioning. We used 1 of several standard tests according to the child's ability: Wechsler Intelligence Scale for Children–III; Leiter International Performance Scale–Revised; Mullen Scales of Early