Randomized Trial of Anger Control Training for Adolescents With Tourette's Syndrome and Disruptive Behavior

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ABSTRACT

Objective: To evaluate the efficacy of a 10-session individually administered anger control training (ACT) for adolescents with Tourette's syndrome (TS) and disruptive behavior. **Method:** Twenty-six subjects (24 boys and 2 girls; mean age 12.7 years, SD 0.88) with TS and high levels of disruptive behavior were randomly assigned to ACT or treatment-as-usual (TAU). The parent-rated Disruptive Behavior Rating Scale and the Clinical Global Impression–Improvement Scale rated by the independent evaluator were used as primary outcome measures. **Results:** All randomized subjects completed end-point evaluation, and all subjects in the ACT group completed 3-month follow-up evaluation. The Disruptive Behavior Rating Scale score decreased by 52% in the ACT group compared with a decrease of 11% in the TAU control group ($p < .001$). On the Clinical Global Impression–Improvement Scale, the independent evaluator rated 9 (69%) of 13 subjects in the ACT condition as much improved or very much improved compared with 2 (15%) of 13 in the TAU condition ($p < .01$). This reduction of disruptive behavior in the ACT group was well maintained at 3-month follow-up. **Conclusions:** Anger control training seems to reduce disruptive behavior in adolescents with TS. Larger trials are needed to confirm these results. *J. Am. Acad. Child Adolesc. Psychiatry,* 2009;48(4):413–421. **Key Words:** Tourette's syndrome, anger, aggression, cognitive-behavior therapy, anger control training. Clinical trial registration information—Anger Control Training for Youth With Tourette's Syndrome. URL: *http://www.clinicaltrials.gov*. Unique identifier: NCT00486551.

Tourette's syndrome (TS) is a disorder of childhood onset characterized by chronic motor and phonic tics. The prevalence of TS in children and adolescents ranges from 1 to 10 per 1,000 in the general population, with the best estimates falling between 3 and 6 per 1,000.[1] Tics usually first appear between the ages of 5 and 7 years and follow a fluctuating course with common worsening between 9 and 12 years. In up to 80% of patients, tics decline by late adolescence.[2,3] Although the etiology is unknown, available evidence suggests that dysregulation of cortical-subcortical circuits is responsible for the symptoms of TS.[4,5]

Fifty percent to 90% of clinically referred children and adolescents with TS have co-occurring attention-deficit/hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), or conduct disorder.[6,7] Disruptive behaviors such as anger outbursts, aggression, and noncompliance have also been reported in up to 40% of patients with TS in community samples.[8–10] The intensity and unpredictability of anger outbursts in response to minimal provocation have prompted appellations such as rage attacks or rage storms.[11] In many cases, disruptive behavior may be a source of greater impairment

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than tics.[12] Consequently, assessment and management of disruptive behavior should be an important part of treatment for children and adolescents with TS.

The primary treatment for TS has been medication directed at tics, ADHD, or obsessive-compulsive disorder.[13] Only two small open-label studies have evaluated the effect of medication on disruptive behavior in TS: a study of paroxetine[14] was inconclusive, and a study of olanzapine showed a modest reduction in aggressive behavior.[15] A recent randomized controlled study of parent management training showed significant short-term improvement in disruptive behavior in school-aged children with chronic tic disorders.[16] Despite the high prevalence of disruptive behavior in TS, there have been no studies of well-established cognitive-behavioral interventions for disruptive behavior disorders in the TS population. To address this gap in clinical research, we conducted a randomized controlled study of anger control training (ACT) in adolescents with TS and disruptive behavior.

Anger control training is a cognitive-behavioral treatment that aims to reduce disruptive behavior by improving emotion regulation and the social-cognitive deficits associated with aggression.[17] First, children are taught to monitor the levels of anger and to use cognitive and behavioral coping skills to manage excessive anger experience and expression. After that, children are encouraged to identify and practice appropriate responses to anger-provoking situations such as being teased by peers or reprimanded by adults. The treatment was first developed for adults[18] and then modified for children[19] and adolescents.[20] Several randomized studies have shown that ACT is effective in children[21,22] and adolescents.[20,23,24] With these results, ACT has been recommended as an empirically supported treatment for youths with disruptive behavior.[25]

Specific aims of this study were as follows: to examine the short-term effects of a 10-session individually administered ACT on disruptive behavior in adolescents with TS, to confirm a clinically relevant effect size (ES) of ACT, and to explore the effects of ACT on measures of associated psychopathology and adaptive functioning.

METHOD

Subjects

Subjects between 11 and 16 years of age were recruited from the Tic Disorders Clinic at the Yale Child Study Center. To be eligible for the study, children had to meet criteria for a diagnosis of TS or chronic tic disorder and display at least a moderate level of disruptive behavior, as evidenced by a score of 12 of higher on the parent-rated Disruptive Behavior Rating Scale, which includes the eight *DSM-IV* symptoms of ODD.[26] Exclusion criteria were IQ below 85 or the presence of an untreated psychiatric condition that warranted standard treatment (e.g., depression, bipolar disorder, psychosis). Concomitant medication was allowed if stable for at least 6 weeks and if there were no planned changes for 3 months. Similarly, concurrent child psychotherapy was allowed to continue, but parents were asked not to initiate any new psychotherapy for their child during the 3-month intervention period. The study was approved by the Yale School of Medicine institutional review board. All subjects provided assent and parents provided consent before randomization. Families were paid $20 for each assessment or treatment visit.

Procedures

Baseline Assessment. The baseline assessment characterized participants, confirmed eligibility, and established the baseline for outcome measures. All subjects were assessed with the Schedule for Affective Disorders and Schizophrenia for School-Age Children,[27] the Yale Global Tic Severity Scale,[28] the Children's Yale-Brown Obsessive-Compulsive Scale,[29] and the parent-nominated target symptoms interview.[30] Intelligence was evaluated with the Kaufman Brief Intelligence Test.[31] Medical history, demographic data, and information about past and current treatments for tics and associated psychopathology were collected by semistructured interview.[32] Standardized parent ratings and child self-report measures (see "Measures") were collected to evaluate associated psychopathology and functioning. The clinical interviews were conducted by experienced clinicians (D.C. and L.S.) who were not part of the intervention program and were blinded to treatment assignment. After a review of all available information, two clinicians independently assigned *DSM-IV* diagnoses[33]; disagreements were resolved by consensus.[34] Diagnosis of TS was confirmed based on the presence of both motor and vocal tics for more than 1 year.

Randomization. Subjects who met eligibility criteria were randomly assigned to receive ACT or to remain in treatment-as-usual (TAU) for 10 weeks. A research assistant, who was not involved in the study intervention or in the outcome assessment, assigned subjects to a study condition using a randomization list set up by the independent statistician before launching the study. The list was blocked to preclude discernable patterns and to assure an equal number of subjects per group by the end of the study. Subjects in the ACT condition were also randomly assigned to one of the two study therapists (D.S. or L.V.). Subjects who were randomized to TAU were offered ACT after completion of the end-point evaluation.

Outcome Assessment. End-point data collection was conducted by an independent evaluator who was blind to treatment assignment. Subjects in the ACT condition were also evaluated at a 3-month follow-up.

Primary Outcome Measures

The Disruptive Behavior Rating Scale (DBRS)[26] is an 8-item parent-rated scale keyed to the *DSM-IV* criteria for ODD. Examples of relevant items on this scale include loses temper, argues with adults, actively defies adult requests, touchy or easily annoyed, and angry and resentful. The parent is asked to rate each item on a four-point scale where 0 = never or rarely, 1 = sometimes, 2 = often, and 3 = very often. The internal consistency of the scale ranges from 0.86 to 0.93,[35] and scores of 12 and higher are considered clinically