Habit Reversal Versus Supportive Psychotherapy for Tourette's Disorder: A Randomized Controlled Trial

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Objective: The authors investigated the efficacy of habit reversal for Tourette's disorder, which is characterized by multiple motor and vocal tics.

Method: Thirty-two patients with Tourette's disorder were randomly assigned to 14 sessions of either habit reversal or supportive psychotherapy. Habit reversal consisted of awareness training, self-monitoring, relaxation training, competing response training, and contingency management. Changes in severity of Tourette's disorder and psychosocial impairment were investigated over the course of the 14-session treatment for the 29 patients who completed at least eight treatment sessions.

Results: In contrast to the 13 patients in the supportive psychotherapy group, the 16 patients in the habit reversal group improved significantly. The habit reversal patients remained significantly improved over pretreatment at 10-month follow-up.

Conclusions: Habit reversal may be an effective behavioral treatment for Tourette's disorder.

(Am J Psychiatry 2003; 160:1175–1177)

Tourette's disorder is characterized by both motor and vocal tics that occur many times a day or intermittently over a period of more than a year (DSM-IV). Tics can range from simple to complex. Common simple tics are eye blinking and throat clearing; common complex tics include grooming behaviors and uttering words. Individuals with Tourette's disorder experience urges to perform tics, which often result in embarrassment and impair daily functioning (1, 2).

To date, pharmacotherapy has been considered the treatment of choice for Tourette's disorder (3). Its efficacy has been demonstrated in placebo-controlled studies (2). However, many patients refuse or discontinue medication because of unwanted side effects; others are unresponsive or suffer from residual tics despite continuing medication (3). Although behavior therapy is known to be safe (with no physical side effects) as well as time- and cost-effective for many behavioral disorders, our scientific knowledge of effective behavioral treatments for Tourette's disorder is limited. The behavioral treatment known as habit reversal (4) has become the nonpharmacological treatment of choice. However, it is supported by only one controlled study (5). Azrin and Peterson (5) reported 93% tic reduction in a group of five patients treated with habit reversal, compared with no improvement among five patients on a waiting list. Although these results are encouraging, further research is necessary given the small number of patients studied. Furthermore, the comparison with a no-treatment group has limitations (e.g., the habit reversal group might have improved because of therapist attention or expectations). Therefore, in the current study we compared habit reversal with supportive psychotherapy in a larger number of patients.

Method

We recruited 36 individuals through newspaper advertisements and outpatient clinician referrals. Four declined to participate after a complete study description. Written informed consent was obtained from the remaining 32 subjects. All participants met DSM-IV criteria for Tourette's disorder; none had comorbid psychosis, current substance abuse, organic mental disorder, or active suicidal depression. They were either unmedicated or had been stable on their medication for at least 3 months before the treatment study and until the end of the study. Patients did not receive any other additional treatment during the study.

Patients were randomly assigned to either habit reversal or supportive psychotherapy. Two therapists provided both individual treatments. The first eight sessions were weekly, and the remainder occurred twice per month. The habit reversal condition consisted of the following major components: awareness training and self-monitoring, relaxation training, competing response procedure, contingency management, and inconvenience review (4). Patients were asked to practice these elements in homework assignments. In the supportive psychotherapy condition, patients selected the session topics and the focus was on experiencing, reflecting, and expressing feelings about current life issues and problem solving. Therapists were nondirective. Techniques that were aspects of habit reversal were not taught.

Outcome was measured with the interviewer-rated Yale Global Tic Severity Scale (6), which quantifies the number, frequency, intensity, complexity, and interference of motor and vocal tics. It provides a tic severity score and an overall impairment score, both ranging from 0 to 50. Interrater reliability (0.80 to 0.91) and convergent validity (0.86 to 0.90) are excellent for both the tic severity score and the overall impairment score (6). Patients also rated themselves on the Clinical Global Impression (CGI) improvement scale (7), which ranges from 1 (very much improved) to 7 (very much worse).

Three patients (two habit reversal, one supportive psychotherapy) dropped out before session 8 and were excluded from data analyses. Patients who dropped out after session 8 (one habit reversal, two supportive psychotherapy) were included. Follow-up data were available for 10 habit reversal and 11 supportive psycho-

therapy participants. Mann-Whitney U tests indicated that the six dropouts did not differ significantly from the other patients in tic severity (U=76.0, p=0.94) or impairment (U=48.5, p=0.16) at baseline. The remaining data were analyzed by using two-tailed chi-square tests and independent- and paired-sample t tests.

Results

The habit reversal group consisted of 16 patients (six female) with a mean age of 36.2 years (SD=12.7) and a mean of 14.8 years of education (SD=2.4). Seven (43.8%) of the habit reversal participants were medicated. The supportive psychotherapy group comprised 13 patients (seven female) whose mean age was 33.2 years (SD=12.2) and who had a mean of 15.2 years of education (SD=3.0). Seven (53.8%) of the supportive psychotherapy participants were medicated.

The treatment groups did not differ significantly with regard to age, education, sex, proportion of medicated patients, baseline severity of tics, or baseline functional impairment level (all p values >0.1). The mean baseline score for severity of tics was 30.50 (SD=7.13) in the habit reversal patients and 26.62 (SD=7.78) in the supportive psychotherapy patients, and the mean functional impairment score was 22.50 (SD=11.97) in the habit reversal patients and 26.92 (SD=7.23) in the supportive psychotherapy patients.

After session 14 (posttreatment), habit reversal patients had significantly lower tic severity scores (mean=19.81, SD=7.58) than supportive psychotherapy patients (mean=26.88, SD=9.19) (t=2.27, df=27, p<0.05). These differences remained significant in an analysis of covariance (ANCOVA) that controlled for baseline tic severity (F=15.52, df=3, 25, p<0.01). Tic severity decreased significantly over the course of treatment in the habit reversal group (t=8.29, df=15, p<0.01), but in the supportive psychotherapy group the tics appeared to be unchanged (t=–0.14, df=12, p=0.89). The within-group effect size for tic severity in the habit reversal group was very large (d=1.50); the effect size in the supportive psychotherapy group was small (d=–0.03).

Habit reversal patients reported significantly lower functional impairment scores at posttreatment (mean=9.44, SD=10.33) than the supportive psychotherapy group (mean=22.69, SD=12.35) (t=3.15, df=27, p<0.01). These differences remained significant in an ANCOVA that controlled for baseline impairment (F=12.14, df=3, 25, p<0.01). Habit reversal patients also experienced a significant decrease in scores from pretreatment to posttreatment (t=4.82, df=15, p<0.01), but the supportive psychotherapy group remained at a nearly stable impairment level over the course of treatment (t=1.35, df=12, p=0.20). In the habit reversal group the within-group effect size for impairment was very large (d=1.09); it was small in the supportive psychotherapy group (d=0.03).

After 10 months, habit reversal patients remained significantly improved over pretreatment with regard to tic severity (mean score=20.95, SD=9.84) (t=5.24, df=9, p<0.01) and impairment (mean score=13.30, SD=10.22) (t=3.54, df=9, p<0.01), but the supportive psychotherapy patients' tic severity (mean score=23.77, SD=7.33) (t=0.39, df=10, p=0.70) and impairment (mean score=22.27, SD=13.44) (t=1.02, df=10, p=0.33) remained at pretreatment levels.

Within both groups, tic severity and impairment did not significantly change from posttreatment to follow-up (all p values ≥0.15). However, a slight increase in tic severity and impairment in the habit reversal group, combined with a slight decrease in these variables in the supportive psychotherapy group over the follow-up period, resulted in a nonsignificant between-group difference in tic severity (t=1.14, df=19, p=0.27). The difference in psychosocial impairment remained significant (t=2.10, df=19, p=0.05).

The CGI improvement ratings for the groups differed significantly (t=0.3.39, df=24, p<0.01). Habit reversal patients were much improved (mean=2.13, SD=0.93), but supportive psychotherapy patients were minimally improved or unchanged (mean=3.55, SD=1.19) at posttreatment.

Discussion

Results of this randomized controlled trial indicate that habit reversal was a more effective treatment for our patients with Tourette's disorder than supportive psychotherapy, which did not seem to have an effect on the severity of the disorder. Nevertheless, after 10 months the difference between the habit reversal and supportive psychotherapy groups in tic severity was no longer significant, which raises questions about the long-term effects of habit reversal.

Our findings indicate that habit reversal may be effective for Tourette's disorder. Therefore, this method should be considered as an adjunct or alternative to pharmacotherapy. Because Tourette's disorder symptoms increased slightly during the follow-up period in the habit reversal group, it might be advantageous to include relapse prevention (e.g., scheduling self-sessions) and booster sessions to help patients maintain their benefits.

Our study has limitations. The Yale Global Tic Severity Scale raters were not blind, and their ratings might have been biased by their expectations. However, the CGI was patient-rated, and at posttreatment the habit reversal patients considered themselves much improved. Moreover, although this is the largest study on habit reversal in Tourette's disorder to date, it is still limited by a relatively small number of subjects. Future larger studies are necessary.

Presented in part at the World Congress of Behavioral and Cognitive Therapies, Toronto, July 17–21, 2001. Received Nov. 7, 2001; revision received Oct. 9, 2002; accepted Jan. 22, 2003. From Massachusetts General Hospital/Harvard Medical School, Boston; McLean Hospital/Harvard Medical School, Belmont, Mass.; and Wilford Hall Medical Center, Lackland Air Force Base, Tex. Address reprint requests to Dr. Wilhelm, Ph.D., Massachusetts General Hospital-East,

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Supported by a Tourette Syndrome Association grant (Dr. Wilhelm).

References

1. Horn S: Gilles de la Tourette syndrome. Clin Neuropharmacol 2001; 24:125–128
2. Riddle MA, Carlson J: Clinical psychopharmacology for Tourette syndrome and associated disorders. Adv Neurol 2001; 85:343–354
3. Piacentini J, Chang S: Behavioral treatments for Tourette syndrome and tic disorders: state of the art. Adv Neurol 2001; 85:319–331
4. Azrin NH, Nunn RG: Habit reversal: a method of eliminating nervous habits and tics. Behav Res Ther 1973; 11:619–628
5. Azrin NH, Peterson AL: Treatment of Tourette syndrome by habit reversal: a waiting list control group comparison. Behav Ther 1990; 21:305–318
6. Leckman JF, Riddle MA, Hardin MT, Ort SI, Swartz KL, Stevenson J, Cohen J: The Yale Global Tic Severity Scale: initial testing of a clinician-rated scale of tic severity. J Am Acad Child Adolesc Psychiatry 1989; 28:566–573
7. Leckman JF, Towbin KE, Ort SI, Cohen DJ: Clinical assessment of tic disorder severity, in Tourette Syndrome and Tic Disorders: Clinical Understanding and Treatment. Edited by Cohen DJ, Bruun D, Leckman JF. New York, John Wiley & Sons, 1988, pp 55–78