Six-Month Follow-Up of a Randomized Controlled Trial Augmenting Serotonin Reuptake Inhibitor Treatment With Exposure and Ritual Prevention for Obsessive-Compulsive Disorder

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ABSTRACT

Objective: This article describes the long-term effects of augmenting serotonin reuptake inhibitors (SRIs) with exposure and ritual prevention or stress management training in patients with *DSM-IV* obsessive-compulsive disorder (OCD).

Method: Between November 2000 and November 2006, 111 OCD patients from 2 academic outpatient centers with partial SRI response were randomized to the addition of exposure and ritual prevention or stress management training, delivered twice weekly for 8 weeks (acute phase); 108 began treatment. Responders (38 of 52 in the exposure and ritual prevention condition, 11 of 52 in the stress management training condition) entered a 24-week maintenance phase. The Yale-Brown Obsessive Compulsive Scale (YBOCS) was the primary outcome measure.

Results: After 24 weeks, patients randomized to and receiving exposure and ritual prevention versus stress management training had significantly better outcomes (mean YBOCS scores of 14.69 and 21.37, respectively; $t = 2.88$, $P = .005$), higher response rates (decrease in YBOCS scores ≥ 25%: 40.7% vs 9.3%, Fisher exact test $P < .001$), and higher rates of excellent response (YBOCS score ≤ 12: 24.1% vs 5.6%, Fisher exact test $P = .01$). During the maintenance phase, the slope of change in YBOCS scores was not significant in either condition (all P values ≥ .55), with no difference between exposure and ritual prevention and stress management training ($P > .74$). Better outcome was associated with baseline variables: lower YBOCS scores, higher quality of life, fewer comorbid Axis I diagnoses, and male sex.

Conclusions: Augmenting SRIs with exposure and ritual prevention versus stress management training leads to better outcome after acute treatment and 24 weeks later. Maintenance outcome, however, was primarily a function of OCD severity at entrance. Greater improvement during the acute phase influences how well patients maintain their gains, regardless of treatment condition.

Trial Registration: ClinicalTrials.gov identifier: NCT00045903

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Cognitive-behavioral therapy (CBT), consisting of exposure and ritual prevention, and serotonin reuptake inhibitors (SRIs) are first-line treatments for obsessive-compulsive disorder (OCD). In randomized controlled trials, exposure and ritual prevention has been shown to be as effective as monotherapy[1] and as an augmentation strategy for OCD patients with a partial response to SRIs.[2,3] Although the acute effects of exposure and ritual prevention have been well established, whether patients maintain their gains over time is not as clear.

Several studies have attempted to address this question. In a review of 16 studies, Foa and Kozak[4] found that 76% of 376 patients who received exposure and ritual prevention (with or without concomitant medication) were judged to be responders at follow-up (mean duration = 29 months; range, 6–72 months). However, some studies in that review were uncontrolled, with naturalistic follow-up, and others did not use evaluators blind to original treatment assignment. In addition, the exact exposure and ritual prevention procedures were inconsistent across studies, with some allowing additional treatments during follow-up, while others did not.

To examine maintenance of gains more systematically, Foa et al[1] compared exposure and ritual prevention, clomipramine, their combination, and pill placebo in 122 adults with OCD. Adults who responded to exposure and ritual prevention (with or without medication) and who then discontinued their treatments (n = 33) had a relapse rate of only 12% over the ensuing 12 weeks.[5] Limitations of the study included the small sample size and the short follow-up period. Van Oppen et al[6] conducted a 5-year follow-up on 102 of 122 OCD patients who participated in 2 randomized controlled trials that compared self-directed exposure and ritual prevention to cognitive therapy. About half of patients in both treatments no longer met criteria for OCD, but over two-thirds received additional treatment after the trial. In yet another study, Whittal et al[7] reevaluated 86 patients from 2 randomized studies in which exposure and ritual prevention was compared to cognitive therapy. About half of the patients had minimal symptoms 2 years later. However, only 57% of the sample who entered the studies was assessed, and 40% received additional treatment. Thus, the degree to which patients who benefit from acute exposure and ritual prevention can maintain their gains without additional treatment is unclear.

To address this gap in the literature, we capitalized on data from our randomized controlled trial that compared the effects

Clinical Points

- Exposure and ritual prevention therapy ameliorates obsessive-compulsive disorder (OCD) symptom severity more than stress management training both after acute therapy and 6 months later among patients who seek further improvement for residual symptoms while taking serotonin reuptake inhibitor (SRI) medication.
- Patients who benefit from cognitive-behavioral therapy augmentation of SRIs tend to maintain their gains irrespective of whether they receive exposure and ritual prevention or stress management training.
- Serotonin reuptake inhibitors followed by exposure and ritual prevention help some but not all OCD patients to attain and maintain an excellent response as defined by minimal OCD symptoms.
- Therapists should make efforts to maximize patients' response to treatment in order to increase the probability that they will maintain their gains.

of exposure and ritual prevention versus stress management training (a credible psychotherapy control) in 108 adults with OCD who had clinically significant symptoms despite receiving adequate doses of SRIs. Exposure and ritual prevention was superior to stress management training in reducing the OCD symptoms after acute treatment.[2] Patients who responded to treatment were then followed for an additional 24 weeks, during which they were maintained on their SRI therapy and received monthly maintenance 45-minute sessions of the therapy to which they were originally randomized. We hypothesized that patients who were randomized to and received exposure and ritual prevention would continue to have lower OCD severity and better functioning than those receiving stress management training at the end of the maintenance phase. We also explored factors associated with the maintenance of response.

METHOD

Overview of Study Design

Data came from a randomized controlled trial whose design is described in detail elsewhere.[2] The study was conducted at 2 academic outpatient clinics, the Anxiety Disorders Clinic, New York, New York, and the Center for the Treatment and Study of Anxiety, Philadelphia, Pennsylvania. Participants were recruited between November 2000 and November 2005 by advertisements, word of mouth, and clinical referral, and data collection ended in 2006. Each site's institutional review board approved the study, which was registered at ClinicalTrials.gov (identifier: NCT00045903).

Of the 111 adults with OCD who entered the study, 108 began treatment (Figure 1); all were on a stable dose of an SRI for at least 12 weeks prior to entry. While continuing their SRI, they were randomized to exposure and ritual prevention (n = 54) or stress management training (n = 54), 2 different forms of CBT. Each treatment included 2 planning/introductory sessions and 15 exposure/skills-training sessions. Sessions were twice weekly, for 90 to 120 minutes plus daily homework assignments. Sociodemographic features and treatment history were assessed at baseline. Clinical symptoms were assessed at baseline (week 0), midtreatment (week 4), at the end of acute treatment (week 8), and during the maintenance phase (weeks 20 and 32). Participants were classified as responders (ie, decrease in Yale-Brown Obsessive Compulsive Scale [YBOCS] scores ≥ 25%) or nonresponders at the end of the acute treatment phase (week 8). Nonresponders were removed from the study and referred for open treatment.

Responders at the end of the acute treatment phase were invited to enter the maintenance phase, during which they continued on their stable SRI dose and received monthly 45-minute maintenance sessions of the CBT to which they were originally randomized. For those randomized to exposure and ritual prevention, the therapist used the maintenance sessions to review relapse prevention strategies and how to apply exposure and ritual prevention techniques to daily life. For those randomized to stress management training, the therapist used the maintenance sessions to review how to apply the stress management techniques learned during the acute phase (eg, structured problem-solving, assertiveness training, relaxation techniques) to the stresses of daily living. Participants who no longer met responder criteria (defined above) at any of the maintenance phase assessments were assessed 1 week later to confirm loss of response status and then removed and referred for open treatment.

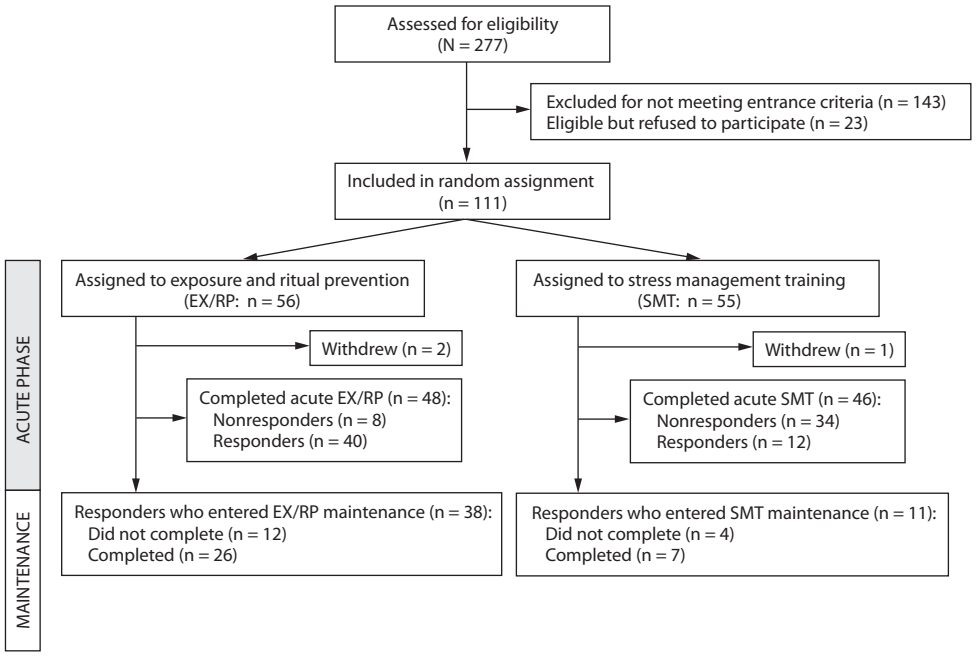
Participants

Participants who began treatment (n = 108) were adults (18–70 years), had a *Diagnostic and Statistical Manual of Mental Disorders,* Fourth Edition (*DSM-IV*) diagnosis of OCD for at least 1 year, and reported at least minimal improvement from an adequate SRI trial yet remained symptomatic (YBOCS score ≥ 16). Patients were excluded for mania, psychosis, prominent suicidal ideation, substance abuse or dependence, an unstable medical condition, pregnancy or nursing, or prior CBT (≥ 15 sessions of either exposure and ritual prevention or stress management training within 2 months) while receiving an adequate SRI trial. Other comorbid diagnoses were permitted if secondary to OCD. Psychiatric diagnoses were confirmed by the Structured Clinical Interview for *DSM-IV,* Patient Edition,[8] and treatment history was confirmed by the prescribing clinician and chart review. All participants provided written informed consent prior to entry.

Assessments

Independent evaluators blind to CBT assignment conducted patient assessments. Symptom severity was evaluated using the YBOCS[9,10] for OCD (the primary outcome measure), the 17-item Hamilton Depression Rating Scale (HDRS)[11] for depression, and the 14-item Hamilton Anxiety Rating Scale (HARS)[12] for general anxiety. At each assessment, patients also completed self-report measures of OCD severity (the Obsessive-Compulsive Inventory-Revised [OCI-R]),[13] quality of life (the Quality of Life Enjoyment and Satisfaction

Figure 1. Patient Flow Diagram (CONSORT) for a Trial of EX/RP or SMT Augmenting SRI Treatment in Obsessive-Compulsive Disorder



Abbreviations: CONSORT = consolidated standards of reporting trials, EX/RP = exposure and ritual prevention, SMT = stress management training, SRI = serotonin reuptake inhibitor.

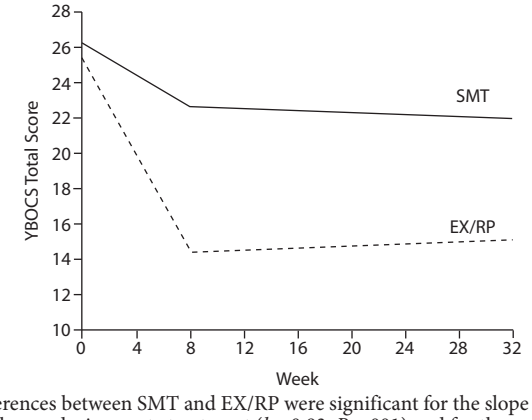
Scale [Q-LES-Q]),[14] and functioning (the Social Adjustment Scale-Self Report [SAS-SR]).[15] In addition, rates of response (defined as a decrease in YBOCS scores ≥ 25%) and of excellent response (YBOCS score ≤ 12) were calculated. For the rationale for these definitions, see Simpson et al.[16]

Data Analysis

Linear mixed-effects models (LMMs) were used to analyze the growth curve of the YBOCS scores. Linear mixed-effects models allow the inclusion of all subjects, irrespective of missing data. Further, they produce accurate and unbiased growth curve parameters even when subjects are dropped from the study due to nonresponse to treatment (as in the current investigation).[17]

Since the growth curve of YBOCS scores changed markedly from acute treatment to maintenance (Figure 2), the growth curve was modeled as discontinuous,[18] allowing all growth curve parameters to change from the acute phase to the maintenance phase of the study. The predictors in the LMM models were time, time squared (the quadratic term for time), treatment condition, treatment condition × time, and treatment condition × time squared. Quadratic terms that were not significant were removed from the analyses. The covariance structure of the errors of the repeated measurement was modeled as first-order autoregressive with heterogeneous variances. Finally, moderators of the growth curve of YBOCS symptoms were explored, using the variables investigated in the original study.[2,19] These included baseline (week 0) YBOCS, HDRS, HARS, Q-LES-Q, and SAS-SR scores, number of comorbid Axis I disorders, number of comorbid Axis II disorders, YBOCS insight item score, presence of prominent hoarding symptoms, duration of OCD, number of SRI trials, sex, age, and married/partnered status. Moderators were added as main effects and as interactions with all of the discontinuous growth curve parameters. First, each moderator candidate was examined separately to determine if it impacted outcome. Since numerous candidates were investigated, we adopted a type I error of $P < .01$ to partially correct for the number of significance tests performed. Significant moderating effects identified in

Figure 2. Discontinuous Growth Curve for Patients Receiving Either SMT or EX/RP (n = 54 per treatment condition) Added to SRI Treatment for Obsessive-Compulsive Disorder[a]



[a]Differences between SMT and EX/RP were significant for the slope of change during acute treatment ($b = 0.93$, $P < .001$) and for the level of Yale-Brown Obsessive Compulsive Scale (YBOCS) scores at end of acute treatment (week 8: $b = 8.14$, $P < .001$) and at the end of maintenance treatment (week 32: $b = 6.68$, $P = .005$).
Abbreviations: EX/RP = exposure and ritual prevention, SMT = stress management training, SRI = serotonin reuptake inhibitor.

these initial analyses were then simultaneously added to the final moderator analysis to identify moderators that uniquely impacted YBOCS scores during maintenance, again using $P < .01$ as the criterion for significance.

As secondary outcomes, we used a Fisher exact test to analyze percentage of responders or excellent responders at the end of maintenance, imputing missing values with the last available observation for these analyses. In addition, the LMM analysis used to investigate YBOCS was also employed to examine the discontinuous growth curves of our other continuous measures (OCI-R, SAS-SR, Q-LES-Q, HARS, and HDRS).

RESULTS

Sample

As shown in Figure 1, 108 patients entered the clinical trial. At the end of the acute treatment phase, 52 were judged to be responders (≥ 25% reduction in YBOCS scores). Forty-nine entered the 24-week maintenance phase, and their demographic and clinical characteristics are shown in Table 1.

Table 1. Sociodemographic and Clinical Characteristics of Entrants to the Maintenance Phase of a Trial of EX/RP or SMT Augmenting SRI Treatment for Obsessive-Compulsive Disorder

Characteristic	EX/RP (n = 38)	SMT (n = 11)	Total (n = 49)
Age, mean (SD), y	36.1 (14.1)	41.7 (11.7)	37.3 (13.7)
Female, n (%)	10 (26)	5 (45)	15 (31)
White, n (%)	33 (87)	9 (82)	42 (86)
Marital status, n (%)			
Single	23 (61)	7 (64)	30 (61)
Married/partnered	12 (32)	2 (18)	14 (29)
Divorced/separated	3 (8)	2 (18)	5 (10)
Week 0 YBOCS score, mean (SD)	25.1 (4.7)	26.4 (4.7)	25.4 (4.7)
Week 0 HDRS score, mean (SD)	7.7 (5.7)	10.1 (6.0)	8.3 (5.8)
Week 8 YBOCS score (those entering maintenance), mean (SD)	11.5 (4.3)	17.0 (4.7)	12.8 (5.0)
Week 8 HDRS score (those entering maintenance), mean (SD)	4.6 (4.6)	6.8 (4.2)	5.1 (4.6)

Abbreviations: EX/RP = exposure and ritual prevention, HDRS = Hamilton Depression Rating Scale, SD = standard deviation, SMT = stress management training, SRI = serotonin reuptake inhibitor, YBOCS = Yale-Brown Obsessive Compulsive Scale.

Primary Outcome: OCD Severity Over Time

YBOCS growth curve. The quadratic components of the YBOCS growth curves were not significant. Thus, these terms were removed, and the final analyses modeled the growth curve as linear during both the acute treatment and maintenance phases (see Figure 2). As reported previously,[2] the slope of decrease in YBOCS scores during the acute treatment phase was significantly steeper in the exposure and ritual prevention condition than in the stress management training condition ($b = 0.93$, $t_{133} = -6.73$, $P < .001$, $d = 1.91$) for the treatment condition × time interaction, and patients in the exposure and ritual prevention condition had significantly lower posttreatment YBOCS scores than those in the stress management training condition (means: exposure and ritual prevention = 14.5 [SD = 6.6], stress management training = 22.7 [SD = 6.3]; $b = 8.24$, $t_{116} = 6.65$, $P < .001$, $d = 1.39$).

During the maintenance phase, the slope of change in YBOCS scores was not significant in either treatment condition ($b = -0.03$, $t_{92} = 0.59$, $P \geq .55$ for the exposure and ritual prevention condition; $b = 0.00$, $t_{70} = 0.04$, $P > .96$ for the stress management training condition), and there was no difference between them ($b = -0.03$, $t_{76} = -0.33$, $P > .74$). These data indicate that the differences in YBOCS scores between treatment conditions observed at the end of acute treatment were retained through the maintenance phase. Indeed, after 24 weeks of maintenance, the differences in YBOCS scores between treatment conditions remained significant and similar in magnitude to those after acute treatment ($b = 6.68$, $t_{69} = 2.88$, $P = .005$, $d = 1.35$). The mean YBOCS score at the end of the maintenance phase was 14.69 (standard error [SE] = 1.1) for exposure and ritual prevention patients versus 21.37 (SE = 2.0) for stress management training patients.

Moderators of the YBOCS growth curve. None of the variables we explored was a significant moderator of any of the treatment or time effects during maintenance (none significantly interacted with any of the growth curve parameters). However, the following variables were predictors of overall level of YBOCS scores across all time points (week 0 through week 32) and across treatment conditions: baseline (week 0) YBOCS, HDRS, HARS, Q-LES-Q, and SAS-SR scores, plus the number of comorbid Axis I and Axis II disorders, number of SRI trials, and sex (all P values $< .01$). The final moderator/predictor analysis, which included all these significant individual predictors, showed that the following were all related to higher YBOCS scores across the maintenance phase (week 20 and week 32) and across treatment condition: higher baseline YBOCS scores ($b = 2.20$, $t_{93} = 5.17$, $P < .001$), lower baseline Q-LES-Q scores ($b = -1.26$, $t_{95} = 2.48$, $P = .01$), more comorbid Axis I diagnoses ($b = 1.16$, $t_{93} = 2.04$, $P = .004$), and female sex ($b = 2.18$, $t_{94} = 2.89$, $P = .005$).

Secondary Outcomes

Responders and excellent responders. At the end of the maintenance phase, significantly more patients randomized to receive exposure and ritual prevention were responders to treatment (decrease in YBOCS scores ≥ 25%: 22 of 54 [40.7%]) than those randomized to receive stress management training (5 of 54 [9.3%]; Fisher exact test $P < .001$). However, the proportion of responders who entered the maintenance phase and who maintained their response status did not significantly differ between the 2 treatment groups (22 of 38 [57.9%] in exposure and ritual prevention versus 5 of 11 [45.5%] in stress management training; Fisher exact test $P > .50$). The pattern was similar for excellent responders. At the end of the maintenance phase, significantly more patients who received exposure and ritual prevention also achieved excellent responder status (YBOCS score ≤ 12; 13 of 54 [24.1%]) than those who received stress management training (3 of 54 [5.6%]), Fisher exact test $P = .01$). However, of those who were responders at the end of the acute treatment phase and thus were eligible to enter the maintenance phase, the proportion of excellent responders at the end of the maintenance phase was similar in both groups (13 of

38 [34.2%] for the exposure and ritual prevention condition versus 3 of 11 [27.3%] for the stress management training condition; Fisher exact test $P = 1.0$). Thus, the observed group difference in the proportion of responders and excellent responders at the end of the maintenance phase was due to the group difference after acute treatment, which was sustained during the maintenance phase.

Growth curves of secondary outcome measures. During the acute phase, patients who received exposure and ritual prevention improved faster than patients receiving stress management training on the OCI-R, Q-LES-Q, and HARS (all P values < .05). At the end of the acute phase, patients in the exposure and ritual prevention condition had lower scores than those in the stress management training condition on all secondary outcomes (OCI-R, SAS-SR, Q-LES-Q, and HARS; all P values < .05), except for the HDRS ($P < .07$).

During the maintenance phase, there were no group differences in the rates of change over time on any secondary outcomes except for the HARS, which showed greater improvement in the stress management training group than in the exposure and ritual prevention group during the maintenance phase ($b = -0.12$, $t_{103} = -2.38$, $P < .05$ for the treatment × time interaction). None of the slopes over time for any of the secondary outcomes in either of the treatment conditions was significant (all P values > .12). For HARS, the differences in slopes between treatment conditions was significant because the slope for exposure and ritual prevention was slightly positive ($b = 0.06$, $P = .12$), while the slope for stress management training was slightly negative ($b = -0.06$, $P = .12$). At the end of the maintenance phase, patients randomized to exposure and ritual prevention had significantly lower scores than patients randomized to stress management training on the OCI-R (means: exposure and ritual prevention = 15.2 [SE = 2.0], stress management training = 21.4 [SE = 2.27]; $b = 5.60$, $t_{138} = 1.95$, $P < .05$) and the SAS-SR (means: exposure and ritual prevention = 1.94 [SE = 0.10], stress management training = 2.25 [SE = 0.13]; $b = 0.29$, $t_{135} = 2.04$, $P < .05$). There were no other differences between treatment conditions at the end of the maintenance phase (all P values > .18).

DISCUSSION

This is the first randomized controlled trial to examine whether the effects of augmenting SRI medication with exposure and ritual prevention are maintained over time. Consistent with our hypothesis, patients who were randomized to and received exposure and ritual prevention had superior outcomes on OCD symptom severity at the end of the maintenance phase compared to those receiving stress management training: they had lower mean YBOCS scores (14.7 vs 21.4), higher rates of response (40.7% vs 9.3%), higher rates of excellent response (YBOCS score ≤ 12: 24.1% vs 5.6%), and lower self-reported OCD severity on the OCI-R. Those receiving exposure and ritual prevention also had better functioning at the end of the maintenance phase, as evidenced by higher scores on the SAS-SR.

Our results add to the understanding of maintenance of gains after acute exposure and ritual prevention in several ways. Although van Oppen et al[6] and Whittal et al[20] found that many OCD patients maintained their response over time, neither study standardized the type of additional treatment patients received after the acute treatment phase. In our study, all patients were maintained on the same SRI therapy, new medications were not permitted, and patients received only monthly maintenance sessions of exposure and ritual prevention and no other psychotherapy. In addition, our analyses included all patients who entered the study. Our data support the conclusion that many patients who respond to exposure and ritual prevention and remain on their SRI therapy can maintain their gains over the 6-month follow-up: about one-quarter of patients who entered exposure and ritual prevention had minimal OCD symptoms 6 months later.

Our results also highlight that how a patient fares long term (with either exposure and ritual prevention or stress management training) depends on his or her response at the end of acute treatment. Specifically, both those receiving exposure and ritual prevention and those receiving stress management training showed little change in OCD severity over the maintenance phase. Thus, patients who received exposure and ritual prevention did better than those receiving stress management training at the end of the maintenance phase because they did better at the end of the acute phase. These findings underscore the importance of maximizing patients' response to treatment (irrespective of the specific treatment used). These results are consistent with our earlier study[21] reporting a high correlation between outcome at the end of treatment and at follow-up in OCD patients receiving exposure and ritual prevention and underscore that therapists should strive to maximize symptom reduction during treatment in order to increase the probability that patients will maintain their gains over time.

Only 1 finding failed to support the notion that patient changes during maintenance were similar across treatments: patients in stress management training improved slightly more than patients in exposure and ritual prevention on the HARS during maintenance. This finding may reflect a regression to the mean, since the patients in exposure and ritual prevention had improved much faster overall than stress management training patients during the acute treatment phase. Alternatively, this result might reflect a real superiority of stress management training, which did focus on reducing general anxiety levels. Future research is needed to examine the generalizability of this finding, since the HARS was the only 1 of 6 measures to show significant differences between treatment conditions during maintenance.

There were no significant moderators of outcome at the end of the maintenance phase. However, there were significant predictors. Specifically, greater OCD severity, lower quality of life, more comorbid Axis I diagnoses, and female sex at entry to the study all predicted poorer outcome at the end of the maintenance phase, even when controlling for each other. Thus, lower quality of life, more Axis I diagnoses, and female sex were related to outcome not simply because they were related to initial severity. Not surprisingly, these variables also predicted poorer outcome at the end of the acute

phase.[18] Interestingly, pretreatment severity of depression did not predict poorer long-term outcome, suggesting that depression does not interfere with maintaining gains from augmenting SRIs with exposure and ritual prevention. That baseline depression does not interfere with long-term gains from exposure and ritual prevention concurs with data from Anholt et al.[22]

One limitation of the study is that the design resulted in a smaller sample size at the maintenance phase than at the acute phase. For ethical considerations, patients who did not improve at the end of the acute treatment were removed from the study to allow nonresponders to access a potentially more effective treatment rather than remain in the study for months without benefit. This action reduced the number of patients who provided data for the maintenance phase of the study, particularly those in the stress management training group (n = 11), because so few of them were treatment responders in the acute phase. Given the small number of stress management training participants during the maintenance phase, great caution must be taken in generalizing the long-term outcome of this treatment. However, simulation studies of missing data models that parallel our study (eg, in which up to 90% of patients were dropped for failing to respond to treatment) show that, even in such extreme cases of missing data, LMMs produce unbiased and accurate estimates of the actual growth curve parameters for the entire initial sample.[16] A second limitation is that the maintenance phase lasted only 24 weeks. On the other hand, it is difficult to provide and to control all treatment that patients receive over longer periods of time, which is why studies with longer follow-up periods[6,7] have adopted naturalistic designs.

In sum, we found that the addition of exposure and ritual prevention to SRIs was superior to the addition of stress management training in adults with OCD not only at the end of acute treatment but also after 6-month follow-up. These data further support the use of exposure and ritual prevention as an SRI augmentation strategy in adults with OCD.

Drug name: clomipramine (Anafranil and others).

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REFERENCES

1. Foa EB, Liebowitz MR, Kozak MJ, et al. Randomized, placebo-controlled trial of exposure and ritual prevention, clomipramine, and their combination in the treatment of obsessive-compulsive disorder. *Am J Psychiatry*. 2005;162(1):151–161.
2. Simpson HB, Foa EB, Liebowitz MR, et al. A randomized, controlled trial of cognitive-behavioral therapy for augmenting pharmacotherapy in obsessive-compulsive disorder. *Am J Psychiatry*. 2008;165(5):621–630.
3. Tenneij NH, van Megen HJ, Denys DA, et al. Behavior therapy augments response of patients with obsessive-compulsive disorder responding to drug treatment. *J Clin Psychiatry*. 2005;66(9):1169–1175.
4. Foa EB, Kozak MJ. Psychological treatment for obsessive-compulsive disorder. In: Mavissakalian MR, Prien RF, eds. *Long-Term Treatments of Anxiety Disorders*. Washington, DC: American Psychiatric Press; 1996:285–309.
5. Simpson HB, Liebowitz MR, Foa EB, et al. Post-treatment effects of exposure therapy and clomipramine in obsessive-compulsive disorder. *Depress Anxiety*. 2004;19(4):225–233.
6. van Oppen P, van Balkom AJ, de Haan E, et al. Cognitive therapy and exposure in vivo alone and in combination with fluvoxamine in obsessive-compulsive disorder: a 5-year follow-up. *J Clin Psychiatry*. 2005;66(11):1415–1422.
7. Whittal ML, Robichaud M, Thordarson DS, et al. Group and individual treatment of obsessive-compulsive disorder using cognitive therapy and exposure plus response prevention: a 2-year follow-up of two randomized trials. *J Consult Clin Psychol*. 2008;76(6):1003–1014.
8. First MB, Spitzer RL, Gibbon M, et al. *Structured Clinical Interview for DSM-IV Axis I Disorders*, Research Version, Patient Edition. New York, NY: Biometrics Research Department, New York State Psychiatric Institute; 1996.
9. Goodman WK, Price LH, Rasmussen SA, et al. The Yale-Brown Obsessive Compulsive Scale, 1: development, use, and reliability. *Arch Gen Psychiatry*. 1989;46(11):1006–1011.
10. Goodman WK, Price LH, Rasmussen SA, et al. The Yale-Brown Obsessive Compulsive Scale, 2: validity. *Arch Gen Psychiatry*. 1989;46(11):1012–1016.
11. Hamilton M. A rating scale for depression. *J Neurol Neurosurg Psychiatry*. 1960;23(1):56–62.
12. Hamilton M. The assessment of anxiety states by rating. *Br J Med Psychol*. 1959;32(1):50–55.
13. Foa EB, Huppert JD, Leiberg S, et al. The Obsessive-Compulsive Inventory: development and validation of a short version. *Psychol Assess*. 2002;14(4):485–496.
14. Endicott J, Nee J, Harrison W, et al. Quality of Life Enjoyment and Satisfaction Questionnaire: a new measure. *Psychopharmacol Bull*. 1993;29(2):321–326.
15. Weissman MM, Bothwell S. Assessment of social adjustment by patient self-report. *Arch Gen Psychiatry*. 1976;33(9):1111–1115.
16. Simpson HB, Huppert JD, Petkova E, et al. Response versus remission in obsessive-compulsive disorder. *J Clin Psychiatry*. 2006;67(2):269–276.
17. Hedeker D, Gibbons RD. *Longitudinal Data Analysis*. Hoboken, NJ: John Wiley & Sons; 2006.
18. Singer JD, Willett JB. *Applied Longitudinal Data Analysis*. New York, NY: Oxford University Press; 2003.
19. Maher MJ, Huppert JD, Chen H, et al. Moderators and predictors of response to cognitive-behavioral therapy augmentation of pharmacotherapy in obsessive-compulsive disorder. *Psychol Med*. 2010;40(12):2013–2023.
20. Whittal ML, Thordarson DS, McLean PD. Treatment of obsessive-compulsive disorder: cognitive behavior therapy vs exposure and response prevention. *Behav Res Ther*. 2005;43(12):1559–1576.
21. Foa, E. B., Grayson, J. B., Steketee, G. S., et al. Success and failure in the behavioral treatment of obsessive-compulsives. *J Consult ClinPsychol*, 1983;51(2):287-297.
22. Anholt GE, Aderka IM, van Balkom AJ, et al. The impact of depression on the treatment of obsessive-compulsive disorder: results from a 5-year follow-up. *J Affect Disord*. 2011;135(1–3):201–207.