INTENSIVE RESIDENTIAL TREATMENT FOR SEVERE OBSESSIVE-COMPULSIVE DISORDER: CHARACTERIZING TREATMENT COURSE AND PREDICTORS OF RESPONSE

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Abstract

Background—Intensive residential treatment (IRT) is effective for severe, treatment-resistant obsessive-compulsive disorder (OCD). We sought to characterize predictors and course of response to IRT.

Methods—Admission, monthly, and discharge data were collected on individuals receiving IRT. We examined the association between baseline characteristics and percent change in OCD symptoms as measured by the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) using linear regression. We compared baseline characteristics of IRT responders (35% reduction in Y-BOCS) versus non-responders, and of patients who did versus those who did not achieve wellness (Y-

BOCS ≥ 12) using non-parametric tests. To examine the course of OCD severity over time, we used linear mixed-effects models with randomly varying intercepts and slopes.

Results—We evaluated 281 individuals admitted to an IRT program. Greater baseline Y-BOCS scores were associated with a significantly greater percent reduction in Y-BOCS scores ($\beta = -1.49$ ([95% confidence interval: -2.06 to -0.93]; $P<.001$). IRT responders showed significantly greater baseline Y-BOCS scores than non-responders (mean (SD) 28 (5.2) vs. 25.6 (5.8); $P=.003$) and lower past-year alcohol use scores than non-responders (1.4 (1.9) vs. 2.1 (2.2); $P=.01$). Participants who achieved wellness displayed lower hoarding factor scores than those who did not (5 (4.6) vs. 9.53 (6.3); $P=.03$). OCD symptoms declined rapidly over the first month but more slowly over the remaining two months.

Conclusions—Higher baseline OCD severity, lower past-year alcohol use, and fewer hoarding symptoms predicted better response to IRT. IRT yielded an initial rapid reduction in OCD symptoms, followed by a slower decline after the first month.

BACKGROUND

Obsessive-compulsive disorder (OCD) is a chronic and often debilitating psychiatric illness, affecting between 2% and 3% of the United States population at some time in their lives (Karno et al., 1988). The current first-line treatments for OCD include both pharmacologic approaches such as the selective serotonin reuptake inhibitors and behavioral treatment such as exposure response prevention therapy. For most OCD patients, these treatments alone or in combination produce at least moderate symptom reduction (Jenike, 2004). However, a subset of OCD patients derives little or no relief from these therapies and requires more intensive treatment approaches. This severe, treatment-refractory subset of cases accounts for nearly all of the OCD-related psychiatric hospitalizations in the United States, as well as the vast majority of social and functional impairment (Ruscio et al., 2010). Thus, it is important to develop specialized treatment approaches targeting this unique and challenging patient population.

One such approach is intensive residential treatment (IRT). IRT utilizes a multidimensional treatment strategy incorporating intensive behavioral, medication, and milieu treatment administered in a residential setting. To date, several studies of IRT have demonstrated a significant reduction in OCD symptoms (Bjorgvinsson et al., 2013; Bjorgvinsson et al., 2008; Boschen et al., 2008; Drummond, 1993; Stewart et al., 2005) that persists post-discharge (Stewart et al., 2009), suggesting that this approach is a viable treatment option for OCD patients with severe and refractory illness. However, given the significant personal and financial investment required for IRT, it is important to seek predictors of response to this treatment. Currently, three studies of IRT have examined outcome predictors for patients with OCD (Bjorgvinsson et al., 2013; Bjorgvinsson et al., 2008; Stewart et al., 2006), but two of these (Bjorgvinsson et al., 2013; Bjorgvinsson et al., 2008) employed modest sample sizes ($N < 50$) and one (Bjorgvinsson et al., 2008) examined only adolescents with OCD.

Moreover, none of these studies examined the longitudinal course of treatment response. Such studies are critical for refining and optimizing the IRT approach.

The Obsessive-Compulsive Disorder Institute at McLean Hospital (OCDI), a representative IRT program, utilizes a multidisciplinary staff to provide intensive behavioral, pharmacologic, and group treatment at both residential and partial hospital levels of care. On average, IRT involves about 2–4 hours of daily exposure response prevention therapy, weekly meetings with psychiatrists who specialize in the pharmacologic management of OCD, and case management with a social worker to address family dynamics and aftercare planning. The average length of stay in the OCDI is approximately 45 days, and about 25% of patients stay at least 3 months.

In a previous study of OCDI patients, our group found that lower initial OCD severity, female sex, and better baseline psychosocial functioning predicted less severe OCD at discharge (Stewart et al., 2006). However, this study did not examine the trajectory of OCD severity over the course of IRT – data that could guide decisions on optimal treatment approaches and length of stay. Therefore, the aims of this study were 1) to replicate and expand upon our previous findings of baseline predictors of response to IRT and 2) to characterize the course of OCD severity over time during IRT treatment. Based on our previous study, we hypothesized that female patients with less severe OCD, better baseline psychosocial functioning, and fewer baseline depressive symptoms would respond best to IRT. We also hypothesized that patients with primary contamination/washing symptoms would respond better to IRT than other patients, since in our experience, contamination/ washing symptoms generally appear more amenable to the exposure response prevention approach. Additionally, based on anecdotal experience, we hypothesized that patients receiving IRT improve rapidly over the first month, but more gradually thereafter.

MATERIALS AND METHODS

Study Population

Study participants were first time-admissions to the OCDI between May 2011 and May 2013 who gave written informed consent to participate in a research database study approved by the McLean Hospital Institutional Review Board. Each participant met admission criteria to the OCDI, which included having severe OCD symptoms, significantly compromised social and occupational functioning, and evidence of treatment resistance to previous medication trials or outpatient behavioral therapies. In addition, each patient had a confirmed diagnosis of OCD based on admission assessments by both a behavioral therapist and a psychiatrist with expertise in OCD.

Clinical Assessments

Each study participant was administered a battery of self-report clinical rating scales upon admission, detailed below, which were repeated monthly and at discharge. Participants also completed an admission demographic questionnaire covering age of onset of OCD symptoms, family history of OCD, marital status, educational background, employment status, and prior diagnosis of post-traumatic stress disorder.

The Yale-Brown Obsessive Compulsive Scale (Y-BOCS), our primary measure of OCD severity, is a 10-item scale with demonstrated reliability used to assess the severity of both obsessions and compulsions, with each item rated on a scale between 0 (lowest severity) and 4 (highest severity) (Goodman et al., 1989). The self-report version of the Y-BOCS has been shown to correlate highly with the clinician-administered version (Federici et al., 2010). The Obsessive Compulsive Symptoms Rating Scale (OCSRS) is a self-report measure that assesses the presence of 67 specific OCD and obsessive-compulsive spectrum symptoms grouped into 22 categories including obsessions (e.g., aggression, contamination, sexual, hoarding, religious, symmetry, somatic), compulsions (e.g., cleaning, checking, repeating, counting, ordering, hoarding), and several miscellaneous categories (Wilhelm and Steketee, 2006). Individuals then rate the severity of each category on a scale from 0 (no problem) to 10 (very severe). These category scores have been shown to be reliable and valid with good internal consistency (Yovel et al., 2012). The Quick Inventory of Depressive Symptomatology – Self Report Version (QIDS-SR$_{16}$), a widely used 16-item self-report scale with demonstrated high internal consistency and validity (Rush et al., 2003), assesses the severity of depressive symptoms. The Work and Social Adjustment Scale (WSA), a 5-item self-report measure of functional impairment, demonstrates good reliability and validity (Mundt et al., 2002) Each item is rated on a scale from 0 (not at all) to 8 (very severe). The 10-item Schwartz Outcome Scale (SOS-10) is a reliable and internally consistent (Blais et al., 1999) quality-of-life measure with higher scores indicating better functioning. The Alcohol Use Disorders Identification Test – Consumption Questions (AUDIT-C), and the Drug Abuse Screening Test (DAST-10) are brief screening questionnaires with demonstrated reliability and face validity (Bush et al., 1998; Skinner, 1982) assessing past-year alcohol and drug use, respectively, with higher scores indicating greater evidence of abuse or dependence.

Using established criteria (Farris et al., 2013), we defined "response" as a decrease in Y-BOCS score of 35% from admission to discharge and "wellness" as a Y-BOCS score of 12 at last assessment. For participants discharged before discharge measures could be obtained, we used the final completed assessment in a last-observation-carried-forward (LOCF) approach.

Statistical Analyses

Univariate Predictors of Response and Wellness—We examined the association between baseline characteristics and percent change in total Y-BOCS scores between admission and discharge assessments using linear regression. Additionally, we compared the baseline characteristics of responders versus non-responders, and of patients who did and did not achieve wellness, using the Wilcoxon rank-sum test for continuous data and Fisher's exact test for categorical data. All baseline characteristics of interest were chosen prior to conducting any analyses and all results (both significant and non-significant) are reported in this manuscript.

We also assessed OCD symptom dimension ratings, obtained at admission, as predictors of response. Using the widely accepted four-factor solution for OCD symptoms, which includes: 1) forbidden thoughts (aggressive, sexual, and religious obsessions) and checking

compulsions; 2) symmetry obsessions and ordering compulsions; 3) contamination obsessions and washing compulsions; and 4) hoarding obsessions and compulsions, (Bloch et al., 2008) we calculated factor scores for each of the four factor domains by adding the symptom category ratings within each factor. Only observations with factor scores greater than zero were considered in the analysis. For each factor dimension, the correlation between factor scores and percent change in Y-BOCS was calculated and the factor scores for responders versus non-responders and for those who achieved wellness versus those who did not were compared.

Modeling the Course of OCD Severity Over Time—To model the course of OCD severity over time, we considered a random intercept and slope (RIS) model for the trajectory of total Y-BOCS over time adjusted for age and sex, where the model is given by:

$$\text{YBOCS}_{ij} = \beta_0 + \beta_1 \cdot \text{time}_{ij} + \beta \cdot \text{confounders} + b_{0i} + b_{1i} \cdot \text{time}_{ij} + \xi_{ij}$$

where b_{0i} is the random intercept, b_{1i} is the random slope, and ξ_{ij} is the random within-subject error, for subjects numbered $i = 1, \dots, 287$ with assessments $j = 1, \dots, n_i$, where the maximum number of assessments n_i varies by patient and can take on values from 1 to 4. Quadratic fixed effects were then added to the above models, followed by cubic effects. Quadratic and cubic *random* effects were not considered due to over-fitting, since subjects in the dataset had a maximum of four assessments, and a majority had two assessments or fewer (see *results* below). Secondary analyses were conducted using transformations of time, specifically log(time + 1) and √time, to assess model fit.

Finally, we performed exploratory analyses using non-parametric methods to better understand the relationship between OCD severity and time. First, we used locally weighted scatterplot smoothing (LOESS) to fit curves of varying smoothness through the scatterplot of Y-BOCS scores versus time since admission. Next, we used penalized smoothing (linear splines for longitudinal data) to model the trajectory of OCD severity, taking into consideration the within-subject variability of the repeated assessments. The latter models were fitted taking knots at every 5, 10, 20, and 30 days. Last, to investigate the possible relationship between length of stay and OCD severity trajectory, we compared the profile plots of participants whose last assessments were at least 30 days post-admission. We did the same for participants whose last assessments were at least 45, 60, and 75 days post-admission.

RESULTS

Baseline Characteristics

We assessed 287 patients admitted for the first time to the OCDI between May 2011 and May 2013. Six of these patients were removed from the analysis for having admission Y-BOCS scores below the wellness criterion (≤ 12). Baseline characteristics of the sample are presented in Table 1. Over half (56%) of participants had received prior treatment with a combination of behavioral therapy and medications, and an additional 32% reported receiving either behavioral therapy (14%) or medications (18%) prior to admission. Despite

this, participants typically reported severe and debilitating symptoms at admission, as indicated by initial Y-BOCS scores (mean (SD) 26.7 (5.6)) and WSA scores (mean 27.3 (7.7)), implying a high degree of treatment-refractoriness.

Of the initial 281 participants analyzed, 58 (21%) had admission data only, 101 (36%) had admission data with one follow-up assessment, 87 (31%) had two follow-up assessments, and 35 (12%) had three follow-up assessments. Discharge measures were obtained on 202 out of the initial 281 participants (72%).

Predictors of Response and Wellness

Of the various baseline characteristics analyzed (Table 2), only baseline Y-BOCS scores significantly predicted percent change in Y-BOCS at discharge ($\beta = -1.49$ ([95% confidence interval: -2.06, -0.93]; $P < .001$; effect size = -2.79 (slope/MSE)); however, some caution must be exercised in interpreting this association because there is necessarily a part-whole (negative) relationship between baseline and change. On the same characteristics, responders showed significantly greater baseline Y-BOCS scores ($P = .003$; effect size = 0.43 ((difference of sample means)/(pooled SD))) and lower AUDIT-C scores ($P = .01$; effect size = 0.34 ((difference of sample means)/pooled SD)), but did not differ significantly on any other characteristics (Table 3). There were no significant differences between participants who achieved wellness and participants who failed to achieve wellness (Table 4).

None of the four dimensional factor scores was significantly associated with percent change in Y-BOCS scores (Table 5), nor did any factor scores differ significantly between responders and non-responders. However, participants who achieved wellness had significantly lower hoarding factor scores than participants who did not achieve wellness ($P = .03$; effect size = 0.94 ((difference of sample means)/pooled SD)) (Table 5).

Time Course of OCD Severity

Goodness-of-fit tests suggested that the best-fitting model of time course was the RIS with cubic fixed effects, both when using transformed or untransformed time. Profile plots of 100 randomly selected participants showed similar trajectories for the three primary adjusted models (Figure 1) over the first 60 days, with the quadratic fixed effects model diverging from the others thereafter. Given the possibility that the trajectory after 60 days was strongly influenced by the small subset of patients staying for more than 60 days, we repeated the same analyses using data restricted to 60 days or less, but the curves remained virtually unchanged from the 90-day model. Therefore, further exploratory analyses using non-parametric methods were performed using data up to 90 days. Analyses using LOESS suggested that improvement occurred rapidly during the first 30 days but more gradually thereafter (Figure 2). Analyses using penalized smoothing with knots at 20 and 30 days yielded similar curves (Figure 3a and 3b). Penalized smoothing using knots of 5 and 10 days suggested a possible temporary spike in OCD symptoms from days 20–40 and another smaller brief spike around the 60-day mark (Figure 3c and 3d). Finally, when all of the time course analyses were repeated without adjustment for age and sex, they yielded identical results.

DISCUSSION

Outcome Predictors

We found that greater baseline OCD severity predicted greater percent reduction in OCD symptoms following IRT. Because some component of this association is due to "regression to the mean", the clinical implications of this result must be interpreted with some care. Similarly, we found that IRT responders exhibited greater baseline OCD severity than non-responders. These findings accord with Bjorgvinsson et al. (Bjorgvinsson et al., 2008) who reported a similar association between greater baseline OCD severity and response to IRT in adolescents with OCD, but contrast with a later study by the same group in adults receiving IRT (Bjorgvinsson et al., 2013) and with our previous study (Stewart et al., 2006). Studies examining outpatients with OCD have consistently demonstrated an association between lower OCD severity and response to cognitive behavioral therapy (CBT) (Keeley et al., 2008; Knopp et al., 2013) and medication (Denys et al., 2003; Shetti et al., 2005; Stein et al., 2001; Storch et al., 2006; Tukel et al., 2006). Thus, our present findings suggest that inpatient IRT may be particularly suited for severe OCD although more rigorous investigation is necessary.

We also found that responders had significantly lower baseline past-year alcohol use scores on the AUDIT-C than non-responders. However, mean scores in these groups were below 3 (the generally accepted threshold for possible abuse or dependence (Bush et al., 1998)), suggesting little evidence of problematic drinking in our sample overall.

While we found no significant association between symptom dimensions and percent change in Y-BOCS or treatment response following IRT, participants who presented with fewer hoarding symptoms were more likely to achieve wellness (Table 5). In agreement with these findings, prior studies of compulsive hoarders have demonstrated poorer treatment outcomes to a variety of treatment approaches including CBT (Abramowitz et al., 2003b; Rufer et al., 2006), behavioral therapy (Mataix-Cols et al., 2002), pharmacologic (Mataix-Cols et al., 1999), intensive multimodal treatment in the context of a partial hospitalization program (Saxena et al., 2002), and limbic surgery (Gentil et al., 2014). Taken together, these findings support the recent view of compulsive hoarding as a distinct disorder separate from OCD that may require different treatment approaches (Pertusa et al., 2010).

In contrast to our prior study, we found no association between sex or level of psychosocial functioning and IRT response. As such, it will be important to expand this research to include IRT populations outside our program in an effort to better understand these contradictory findings.

Characterization of Treatment Course

We found rapid improvement in OCD symptoms over the first 20–30 days of IRT treatment. This finding is consistent with previous studies showing a rapid reduction in OCD symptoms among patients receiving intensive daily outpatient exposure response prevention treatment over a 3–4 week period (Abramowitz et al., 2003a; Foa et al., 2005; Storch et al., 2008) – an approach that closely resembles the behavioral component of IRT. We also found

a more gradual decline in OCD symptoms over the subsequent 2 months of IRT, consistent with our initial hypothesis and clinical experience.

Unexpectedly, we found a possible spike in OCD symptoms from days 20–40 and again around day 60 of treatment. Although these spikes may represent statistical artifacts, there is anecdotal clinical experience to support the first spike in symptoms. Several mechanisms could contribute to this so-called "rebound phase". First, since patients are changing environment to enter IRT, which may mean leaving a home environment that is much more triggering, it is possible that some may experience a "honeymoon period" during the first few weeks of treatment. As new triggers are established in the IRT environment, these patients may experience a worsening of symptoms. Second, due to the significant psychoeducational component of IRT treatment, it is possible that patients uncover previously unrecognized obsessions and/or compulsions over the course of treatment as they become more adept at identifying OCD symptoms. Third, given the step-wise hierarchical nature of ERP treatment which begins with easier exposures and gradually progresses to more challenging ones, it is possible that patients are not habituating as quickly to more difficult exposures as they did earlier in treatment. However, since patients were not receiving a standardized timeline of ERP, which moved patients up their exposure hierarchy only between days 20–40 and after day 60, this explanation is less likely.

Implications for Treatment

Several findings from this study may inform the future delivery of IRT. First, we found that patients with the most severe OCD derived the greatest reduction in symptoms following IRT. This finding contrasts sharply with studies involving outpatient treatment modalities, suggesting that IRT may represent the treatment of choice for severe, treatment-refractory patients. Second, while OCD symptom dimensions do not influence overall symptom reduction or treatment response, patients with fewer hoarding symptoms are more likely to achieve wellness following IRT. Third, greater past-year alcohol use may predict a poorer response to IRT. However, this finding appears unrelated to problematic drinking. Fourth, IRT appears to produce a rapid reduction in OCD symptoms over the first month of treatment, in contrast to outpatient behavioral and pharmacologic treatments for OCD, which typically require 8–12 weeks and often yield modest symptom reduction (Jenike, 2004). As such, IRT may be particularly indicated for patients with severe OCD who require acute intervention to rapidly relieve incapacitating symptoms. Fifth, our data suggest that while patients show rapid improvement over the first month of IRT, this improvement slows in subsequent months and might be disrupted by brief periods of worsening. This finding raises the question of whether the slope of improvement after one month is sufficient to justify the cost of IRT beyond the 30-day mark. Future studies should also assess whether additional interventions, introduced early in treatment, might maintain the steeper trajectory of symptom reduction beyond the first month. One intriguing possibility is the use of d-cycloserine, which has shown preliminary evidence as a pharmacologic enhancer of exposure response prevention therapy for OCD (Kushner et al., 2007; Wilhelm et al., 2008) – primarily through a hastening of the habituation process (Chasson et al., 2010).

Limitations

We acknowledge several limitations to this study. First, we did not include a structured clinical interview on admission, and thus could not include comorbid diagnoses other than depression, post-traumatic stress disorder, and substance use disorders in our analyses of outcome predictors. Given that comorbid mental disorders impact outcome in both cognitive behavior therapy (Keeley et al., 2008) and medication treatment (Baer et al., 1992; Cavedini et al., 1997; Ravizza et al., 1995) in OCD, future studies of IRT treatment predictors should assess for these comorbid conditions. Second, we cannot assess potential "placebo" response (that is, non-specific effects of expectation) in our sample without the inclusion of a control treatment group. A control group would also defend against the "regression to the mean" concern mentioned earlier. Third, while our initial sample was 281 participants, the number of participants providing follow-up data declined steadily over the course of treatment, resulting in a smaller sample with 2 and 3 assessments post-admission. Furthermore, missing data at discharge have the potential to bias the effect of treatment on wellness and response. Thus, future IRT studies examining longitudinal clinical data in larger samples will be necessary. The longitudinal models presented in the present initial study may help to guide such future investigations. Fourth, we did not correct for multiple statistical comparisons so our findings are exploratory and must be interpreted with some caution. Fifth, we did not measure other potentially clinically important variables that have been shown previously to be significant predictors of outcome (such as comorbid tics, level of insight, treatment expectancy, and past number of medication and CBT trials) and therefore could not examine these variables as predictors of outcome. Future research should examine these potential predictors as well as confirm the significant results of this study.

Conclusions

In patients with severe, treatment-refractory OCD, inpatient residential treatment (IRT) was associated with a rapid reduction of OCD symptoms over the first 30 days of treatment and a more gradual decline in symptoms over the remaining 60 days. Individuals with greater baseline OCD severity and less prior alcohol use responded better to IRT while those with fewer hoarding symptoms were more likely to achieve wellness. Future investigations of these issues may help to elucidate the optimal length of stay in the IRT setting, as well as possible interventions to enhance IRT response and achieve overall wellness.

Acknowledgments

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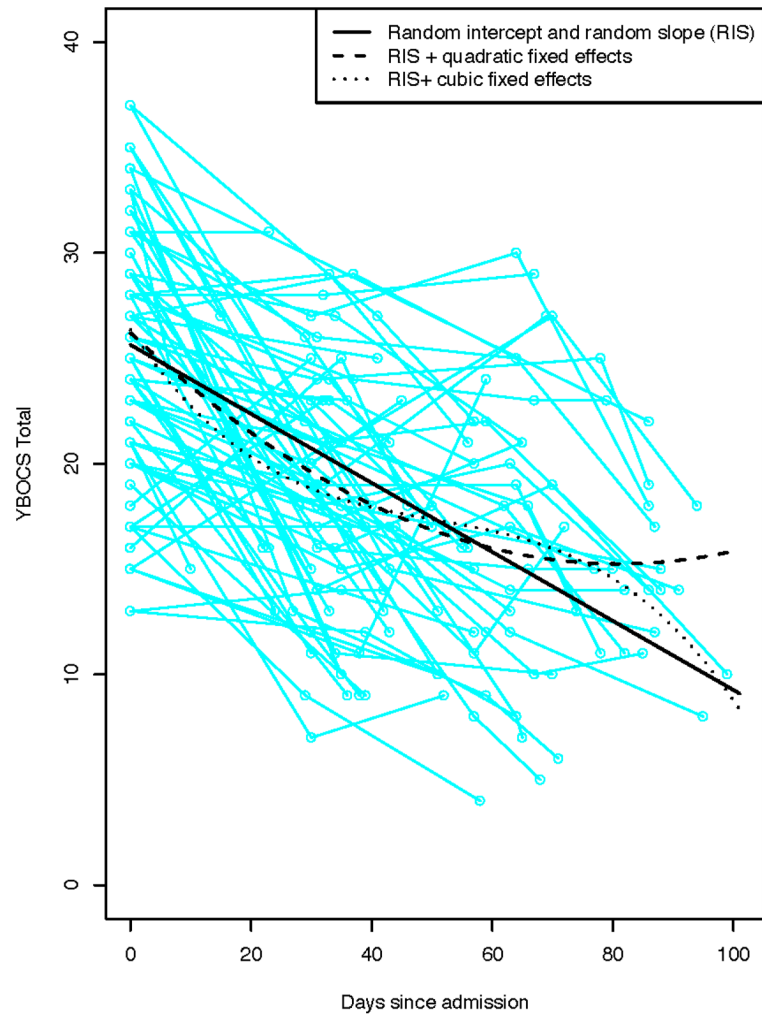
Figure 1.
Profile plots from 100 randomly selected individuals receiving intensive residential treatment for obsessive-compulsive disorder showing the mean trajectories of total Y-BOCS scores over time for the primary adjusted RIS models considered. RIS, Random intercept and random slope; Y-BOCS, Yale-Brown Obsessive-Compulsive Scale.
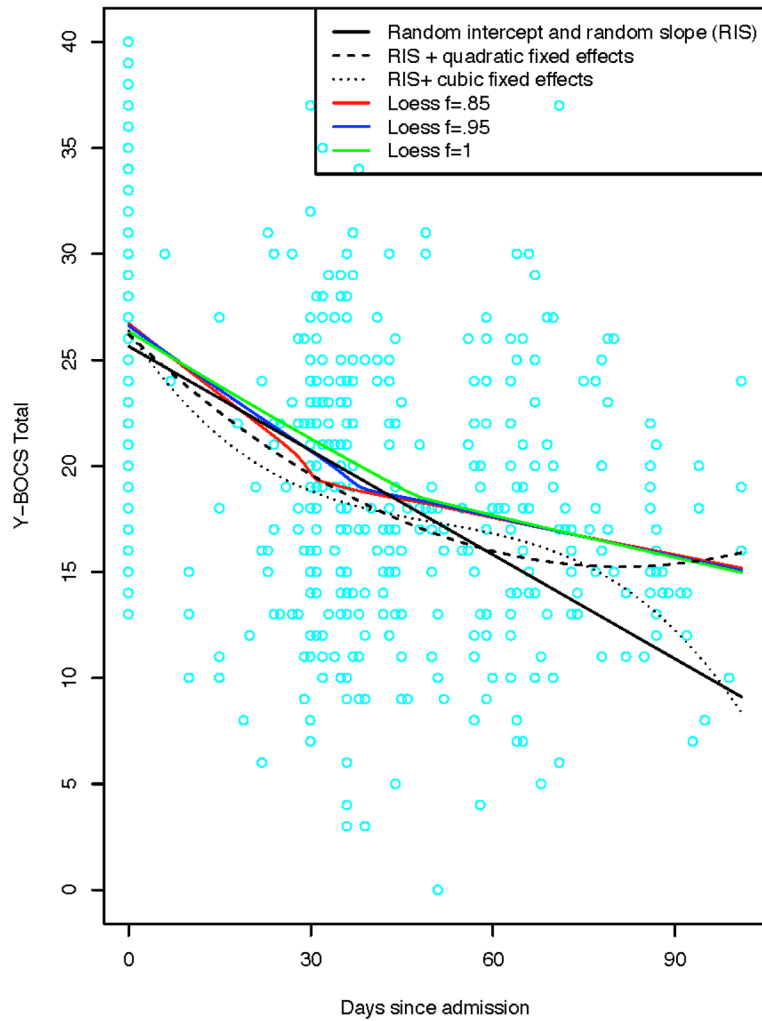
Figure 2.
Scatterplot of total Y-BOCS scores versus time for individuals receiving intensive residential treatment for obsessive-compulsive disorder with LOESS curves of varying degrees of smoothness and mean trajectories for the primary adjusted RIS models considered. RIS, Random intercept and random slope; Y-BOCS, Yale-Brown Obsessive-Compulsive Scale.

Figure 3.
Mean trajectories of total Y-BOCS scores over time using penalized smoothing for knots at every (a) 30 days, (b) 20 days, (c) 10 days, and (d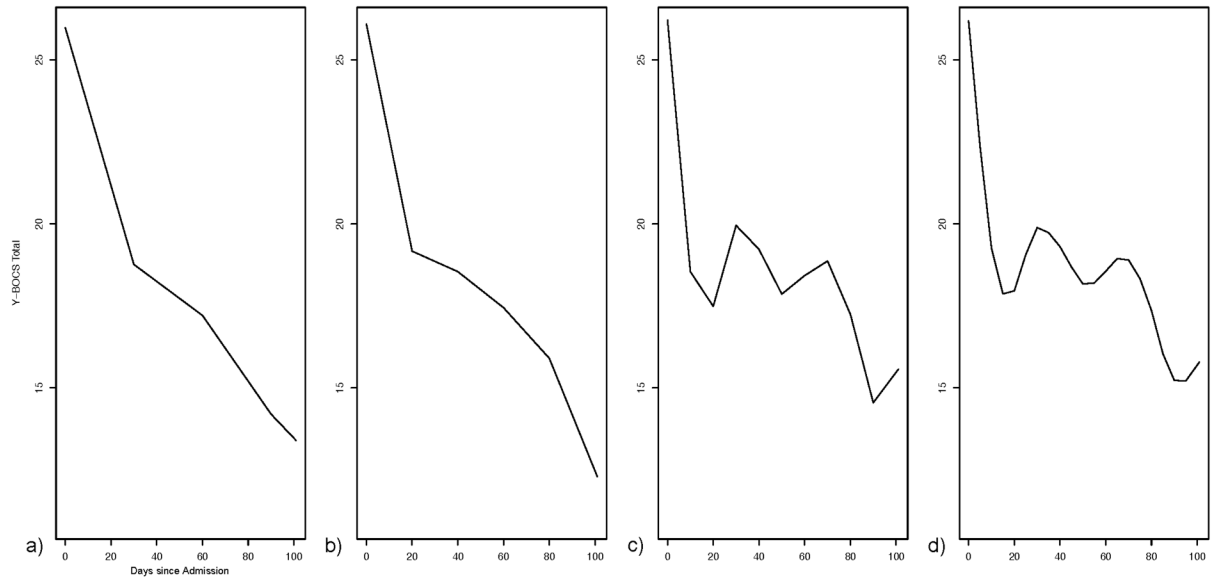) 5 days for individuals receiving intensive residential treatment for obsessive-compulsive disorder. Y-BOCS, Yale-Brown Obsessive-Compulsive Scale.

TABLE 1

Demographic and Clinical Characteristics of the Subjects at Admission

Characteristic	N (%)	Mean (SD)	Range
Age, years (*N* = 281)		33.5 (13.8)	16–78
Sex (*N* = 281)			
Male	143 (51)		
Female	138 (49)		
Education (*N* = 274)			
High School Diploma/GED	88 (32)		
Some College or Associates Degree	57 (21)		
Bachelors Degree	89 (32)		
Graduate Degree	40 (15)		
Employment (*N* = 275)			
Employed	81(29)		
Unemployed or On Leave	194 (71)		
Marital status (*N* = 275)			
Single	202 (73)		
Married or Partner	54 (20)		
Divorced or Separated	19 (7)		
Payment method (*N* = 275)			
Managed care	215 (78)		
Medicare/Medi-caid	48 (18)		
Self-pay	12 (4)		
Past treatment (*N* = 270)			
Behavioral therapy	38 (14)		
Medication	49 (18)		
Behavioral therapy and medication	151 (56)		
Other treatment method	18 (7)		
Never received treatment	14 (5)		
Age of OCD Onset, years *(N = 235)*		14.3 (9.6)	0–61
Duration of OCD, years *(N = 235)*		18.8 (13.4)	1–64
Yale-Brown Obsessive Compulsive Scale *(N = 281)*		26.7 (5.6)	13–40
Quick Inventory of Depressive Symptomatology *(N = 280)*		13.3 (5.4)	1–26
Work and Social Adjustment Scale *(N = 204)*		27.3 (7.7)	0–40
Schwartz Outcome Scale *(N = 204)*		23.6 (10.5)	0–54
Time between admission and last assessment, days *(N = 223)*		52.5 (22.7)	6–101

Table 2

Association Between Clinical Characteristics at Admission and Percent Change in Total Y-BOCS Between Last and First Assessments

Characteristic	Slope	Slope SE	Slope p-value	Slope 95% CI
Age	0.06	0.12	0.64	(−0.18, 0.30)
Age of OCD onset	−0.12	0.18	0.50	(−0.47, 0.23)
Alcohol Use Disorders Test - Consumption	1.59	0.84	0.06	(−0.06, 3.24)
Drug Abuse Screening Test-10	−0.06	1.36	0.96	(−2.75, 2.62)
Yale-Brown Obsessive Compulsive Scale	−1.49	0.29	<.001	(−2.06, −0.93)
Quick Inventory of Depressive Symptomatology-16	0.42	0.32	0.19	(−0.21, 1.04)
Work and Social Adjustment Scale	−0.13	0.27	0.64	(−0.66, 0.41)
Schwarz Outcome Scale, 10 item	−0.17	0.19	0.37	(−0.55, 0.21)
Duration of illness	−0.06	0.14	0.69	(−0.34, 0.22)
Male	2.50	3.42	0.47	(−4.25, 9.24)
Married/partner	−6.82	4.43	0.13	(−15.56, 1.92)
Currently employed	−1.14	3.74	0.76	(−8.51, 6.23)
Family history of OCD	−0.30	3.48	0.93	(−7.16, 6.55)
History of posttraumatic stress disorder	−7.33	5.72	0.20	(−18.6, 3.95)
Payment method[a]				
Managed care	−7.6	9.21	0.41	(−25.8, 10.5)
Medicare/Medi-caid	−9.0	9.98	0.37	(−28.7, 10.7)
Past treatment[b]				
Behavioral therapy	−1.20	8.60	0.89	(−18.1, 15.8)
Medication	0.71	8.60	0.94	(−16.2, 17.7)
Behavioral therapy and medication	−2.14	7.78	0.78	(−17.5, 13.2)
Other treatment method	3.75	9.67	0.70	(−15.3, 22.8)
Education[c]				
Some college or Associates degree	4.88	4.93	0.32	(−4.85, 14.6)
Bachelors degree	−0.84	4.19	0.84	(−9.1, 7.42)
Graduate degree	−9.77	5.42	0.07	(−20.5, 0.91)

[a]Reference group = Self-pay

[b]Reference group = Never received treatment

[c]Reference group = High school diploma or GED

Table 3

Clinical Characteristics at Admission of Responders Versus Non-responders

Characteristic	Non-responders (N = 110)		Responders (N = 113)		p-value
	N	Mean (SD)	N	Mean (SD)	
Age	110	33.4 (14.5)	113	33.4 (13.4)	0.81
Age of OCD onset	88	13.6 (7.9)	98	15.6 (12.1)	0.53
Alcohol Use Disorders Test - Consumption	108	2.1 (2.2)	109	1.4 (1.9)	0.01
Drug Abuse Screening Test-10	110	0.8 (1.0)	113	0.8 (1.5)	0.33
Yale-Brown Obsessive Compulsive Scale	110	25.6 (5.8)	113	28 (5.2)	0.003
Quick Inventory of Depressive Symptoms-16	110	13.6 (5.3)	113	13.4 (5.5)	0.81
Work and Social Adjustment scale	84	26.9 (7.9)	76	28.1 (7.3)	0.3
Schwartz Outcome Scale-10	84	24.6 (11.4)	76	22.5 (10.2)	0.15
Duration of illness	88	18.8 (13.8)	98	18.2 (12.4)	0.96

Characteristic	N	N (%)	N	N (%)	p-value
Male	110	58 (52.7)	113	60 (53.1)	1
Married/partner	108	15 (13.9)	109	25 (22.9)	0.12
Currently employed	108	30 (27.8)	109	37 (33.9)	0.38
Family history of OCD	108	56 (51.9)	108	62 (57.4)	0.49
PTSD history	106	10 (9.4)	108	12 (11.1)	0.82
Payment method					
Managed care	108	86 (79.6)	109	88 (80.7)	0.87
Medicare/Medi-caid	108	18 (16.7)	109	17 (15.6)	0.86
Self-pay	108	4 (3.7)	109	4 (3.7)	1
Past treatment					
Behavioral therapy	106	16 (15.1)	108	17 (15.7)	1
Medication	106	16 (15.1)	108	17 (15.7)	1
Behavioral therapy and medication	106	59 (55.7)	108	62 (57.4)	0.89
Other treatment method	106	9 (8.5)	108	7 (6.5)	0.61
Never received treatment	106	6 (5.7)	108	5 (4.6)	0.77
Education					

Characteristic	Non-responders (*N* = 110)		Responders (*N* = 113)		
	N	Mean (SD)	*N*	Mean (SD)	p-value
High school diploma or GED	108	36 (33.3)	109	36 (33.0)	1
Some college or Associates degree	108	24 (22.2)	109	17 (15.6)	0.23
Bachelors degree	108	38 (35.2)	109	35 (32.1)	0.67
Graduate degree	108	10 (9.3)	109	21 (19.3)	0.051

Table 4

Clinical Characteristics at Admission of Participants Who Achieved "Wellness" Versus Participants Who Did Not

Characteristic	Wellness not acheived (N = 174)		Wellness achieved (N = 53)		
	N	Mean (SD)	N	Mean (SD)	p-value
Age	173	33.3 (14.1)	50	33.7 (13.4)	0.83
Age of OCD onset	141	14.2 (9.2)	45	16.1 (13.2)	0.36
Alcohol Use Disorders Test - Consumption	167	1.9 (2.1)	50	1.4 (1.8)	0.14
Drug Abuse Screening Test-10	173	0.8 (1.3)	50	0.6 (1.2)	0.38
Yale-Brown Obsessive Compulsive Scale	173	27.1 (5.4)	50	25.7 (6.5)	0.16
Quick Inventory of Depressive Symptoms-16	173	13.8 (5.5)	50	12.5 (4.9)	0.11
Work and Social Adjustment scale	130	27.6 (7.8)	30	26.5 (7.1)	0.46
Schwartz Outcome Scale-10	130	23.3 (10.8)	30	25.1 (11.1)	0.43
Duration of illness	141	18.5 (13.4)	45	18.2 (11.7)	0.86

Characteristic	N	N (%)	N	N (%)	p-value
Male	173	92 (53.2)	50	26 (52.0)	1
Married/partner	170	33 (19.4)	47	7 (14.9)	0.53
Currently employed	170	53 (31.2)	47	14 (29.8)	1
Family history of OCD	170	94 (55.3)	46	24 (52.2)	0.74
PTSD history	168	14 (8.3)	46	8 (17.4)	0.1
Payment method					
Managed care	170	135 (79.4)	47	39 (83.0)	0.68
Medicare/Medi-caid	170	27 (15.9)	47	8 (17.0)	0.83
Self-pay	170	8 (4.7)	47	0 (0)	0.21
Past treatment					
Behavioral therapy	168	27 (16.1)	46	6 (13.0)	0.82
Medication	168	26 (15.5)	46	7 (15.2)	1
Behavioral therapy and medication	168	93 (55.4)	46	28 (60.9)	0.62
Other treatment method	168	13 (7.7)	46	3 (6.5)	1
Never received treatment	168	9 (5.4)	46	2 (4.3)	1
Education					

Characteristic	Wellness not acheived (N = 174)		Wellness achieved (N = 53)		
	N	Mean (SD)	N	Mean (SD)	p-value
High school diploma or GED	170	55 (32.4)	47	17 (36.2)	0.73
Some college or Associates degree	170	36 (21.2)	47	5 (10.6)	0.14
Bachelors degree	170	59 (34.7)	47	14 (29.8)	0.60
Graduate degree	170	20 (11.8)	47	11 (23.4)	0.058

Table 5

Symptom Dimension Factor Scores of Participants Who Achieved "Wellness" Versus Participants Who Did Not

| Symptom dimension | Wellness not acheived | | Wellness achieved | | |
	N	Mean factor score (SD)	N	Mean factor score (SD)	p-value
Symmetry (N =109)	56	11.1 (7.2)	53	10.1 (8.3)	0.36
Forbidden thoughts (N =134)	110	15.2 (10.6)	24	11.9 (10.1)	0.07
Contamination (N =115)	93	10.7 (5.9)	22	11.2 (6.8)	0.81
Hoarding (N =65)	57	9.53 (6.3)	8	5 (4.6)	0.03