Cognitive behaviour therapy and medication in the treatment of obsessive–compulsive disorder


Objective: To compare cognitive behaviour therapy (CBT) with CBT plus medication; medication alone; and placebo in the treatment of adult obsessive–compulsive disorder (OCD).

Method: Forty-eight participants (43 completers) were recruited into two protocols. In the first protocol, 21 people with OCD were randomly allocated to either a standard medication (fluvoxamine) or standard placebo condition for a 5-month period. Both these groups subsequently received CBT for a further 5 months. In the second protocol, 22 people with OCD received CBT, one group was already stabilized on an antidepressant of choice; the second group was drug naïve.

Results: All active treatments, but not the placebo, showed clinical improvement. There was no difference in treatment response to CBT regardless of whether participants had previously received medication or placebo.

Conclusion: CBT has a more specific antiobsessional effect than medication but CBT plus medication shows greatest overall clinical improvement in mood.

Significant outcomes
- Cognitive behaviour therapy (CBT) only, CBT following individualized medication, CBT following standardized medication, and CBT following placebo, all showed an equivalent clinically significant decrease in obsessional symptoms and obsessional beliefs.
- CBT alone produced greater change in clinical outcome than medication alone.
- CBT produced a greater antiobsessional effect than medication, but medication combined with CBT enhanced outcome for depression.

Limitations
- The sample sizes were relatively small, although sufficient to produce robust effects.
- The sample was limited to those suffering principally from overt compulsions.
- Allocation to the groups receiving medication only and placebo only, followed by CBT was randomized but the comparison group receiving individualized medication and CBT and CBT only was recruited separately, although clinical characteristics of all groups were equivalent.
Cognitive behaviour therapy and medication in OCD

Introduction

Both cognitive behaviour therapy (CBT) and pharmacotherapy, in particular serotonin reuptake inhibitors (SRI), have been recognized as effective treatments for obsessive-compulsive disorder (OCD) when compared with wait-list or inactive treatment controls (1). There have been few head-to-head comparisons either of individual medications or between medication and CBT. Meta-analytic reviews have generally reported a superiority of CBT on the basis that relapse is less probable (2, 3). However, a sizeable proportion of patients do not benefit from either treatment and combination treatments or augmentation strategies remain a potential solution. Despite the advocacy of some clinicians for a combined medication plus CBT approach for treatment-resistant cases, there is little data available on combined efficacy, and previous studies report mixed results (4).

In an early study, Rachman et al. (5) compared four treatment modalities in 48 patients with overt compulsions of whom 40 completed. The four conditions were clomipramine plus exposure in vivo and response prevention (ERP); clomipramine plus relaxation; placebo plus ERP; and placebo plus relaxation. The design was a partial cross-over design so that patients were randomly allocated to 15 sessions of either ERP or relaxation and both groups received a further 15 sessions of ERP. At post-treatment, the clomipramine was superior to placebo but mainly for the most depressed patients. At 6 years follow-up, there was no difference between conditions, except those receiving 30 sessions of ERP (15 + further 15) showed greater clinical improvement than those receiving only 15 sessions.

Marks et al. (6) compared four treatment conditions over 17 weeks of treatment. Fifty-five patients with OCD, of whom 49 completed, were randomly allocated to clomipramine combined with 23 weeks of ‘antiexposure’ instructions; 23 weeks of self-controlled in vivo ERP; either placebo or clomipramine administered double-blind with self-controlled ERP week 1–8 and thereafter therapist-controlled ERP week 8–23. Initially after 8 weeks, clomipramine plus ERP seemed more effective than placebo plus ERP, and clomipramine with antiexposure was inferior to clomipramine plus exposure. Marks et al. (6) concluded that of the three therapeutic factors tested, self-exposure was the most potent; clomipramine played a limited adjuvant role, and therapist-aided exposure a marginal one. But both at 23 weeks post-treatment and at 2-year follow-up there was no difference between the four groups.

Cottraux et al. (7), in a controlled randomized trial, compared four conditions in 60 participants with OCD of whom 44 completed. The four conditions were fluvoxamine plus ‘antiexposure’ instructions; fluvoxamine plus ERP; placebo plus ‘antiexposure’; and placebo plus ERP. After 24 weeks of treatment, the medication was tapered. Those taking fluvoxamine improved in mood compared with placebo. Those receiving both fluvoxamine plus ERP appeared to show greater improvement but the trend was not significant. There was a high dropout rate (27%) with higher dropout in the fluvoxamine plus ‘antiexposure’ group (35%) than in the fluvoxamine plus ERP (20%), perhaps because of lack of credibility of the antiexposure condition, but there was no intention to treat analysis.

Foa et al. (8) explicitly investigated the hypothesis that medication acts principally on depressed mood by comparing outcome in a sequential combination study in 48 patients with OCD of whom 38 completed, and half were followed up at 2 years. Patients were divided into two groups of mild and severely depressed. The patients first received stabilization on imipramine and then 15 two-hour sessions of ERP. The medication was tapered off after 22 weeks. At the end of the treatment, no significant differences were found between groups on clinical measures of OCD symptomatology but imipramine seemed to improve depressive symptoms more than placebo.

These earlier studies focused on ERP as the treatment of choice and did not incorporate recent cognitive developments which might aid motivation or readiness to comply with exposure. There is evidence that cognitive therapy (CT) can be usefully combined with ERP to form a seamless and more effective CBT package for OCD. van Balkom et al. (9) evaluated CT and ERP in people with OCD and overt compulsions. These authors also examined whether CBT would be enhanced by the addition of fluvoxamine prior to starting therapy. The authors conducted one of the larger scale studies in this area by allocating 117 patients of whom 70 completed to one of five treatment conditions: 16 sessions of CT alone; 16 sessions of ERP alone; fluvoxamine plus ten sessions of CT after 8 weeks of stabilization; fluvoxamine plus ten sessions of ERP after 8 weeks of stabilization; 8-week waiting list period only. However, the CT and ERP only conditions received six more initial therapy sessions than the combined conditions. The CT involved principally socratic dialogue and challenging and replacing automatic thoughts. At the
end of the 16-week treatment period, there were no significant differences in outcome. Also there were no significant differences in responders, defined as six-point improvement on the Yale-Brown Obsessive–Compulsive Scale (Y-BOCS). The authors note that the intent-to-treat analyses were identical to the completer analyses suggesting that the effect of CBT (CT or ERP) was not enhanced by adding fluvoxamine at the start of therapy. However, drop out in the two fluvoxamine conditions was much greater than for the CBT conditions. The improved symptoms and depressive mood were maintained at 6-month follow-up.

The medication used in the majority of these studies was either fixed or optimal dosage of clomipramine or fluvoxamine. These two medications have equivalent effects overall and seem preferred to other SRI medication (2). Fluvoxamine has a potency equivalent to clomipramine for blocking serotonin uptake and causes minimal inhibition of the dopamine system. It has been shown to be more effective than placebo in both obsessions and compulsions, and produces modest but significant decrease in Y-BOCS at 6–8 weeks of treatment, with up to 43% of patients showing >25% improvement of baseline Y-BOCS score (10). Hollander et al. (11) showed controlled release fluvoxamine more effective than placebo and safe and well tolerated with therapeutic effect after 2 weeks, and with a mean decrease of 31% in Y-BOCS at 12 weeks.

O’Connor et al. (12) compared medication, waitlist, medication plus CBT, and CBT alone, in a small scale study which showed powerful enough effect sizes to conclude that either medication or CBT was better than no treatment and further, that the combined treatment of CBT plus medication showed overall better clinical outcome. O’Connor et al. (12) did measure cognitive variables and found that although all modalities affected obsessional beliefs, CBT had the most effect on obsessional conviction.

The results of these studies suggest that CBT and medication achieve equivalent results. However, the advantage of adding CBT to pharmacotherapy, particularly to aid relapse, is clearer than adding pharmacotherapy to CBT either before, during or after CBT (4). Hembree et al. (13), in a long-term follow-up (6–43 months) of 62 patients who had received medication (fluvoxamine or clomipramine), ERP or both, found a benefit for ERP and ERP plus medication compared with medication only, particularly for those who had since ceased medication. Tolin et al. (14) noted that CBT might aid those who have not benefited from medication and when a sample of 20 adult OCD with an history of inadequate response to multiple medications, and with poor insight and compliance problems received 15 sessions of CBT, 53% showed further clinically significant change, mostly maintained at 6-month follow-up.

There is little in the way of predictors to aid in choice of the different medications and often several trials are necessary to establish effective treatment (15). Ravizza et al. (16) studied schizotypal personality disorder, severity of compulsion and chronicity of illness as factors affecting treatment compliance. Other personality disorders, depression, and the role of beliefs and attitudes may also play a role in predicting outcome but there is little hard evidence (17). Neziroglu et al. (18) showed the presence of overvalued ideation in OCD predicted outcome on the Y-BOCS obsessions scale.

Limitations of previous studies comparing CBT and CBT plus medication strategies include a lack of head-to-head comparisons between different SRI medications and between medications and CBT. Often in these studies, the order of combination has led to additive effects confounding main treatment effects. The medication is often fixed dose and limited to one SRI type despite evidence of head-to-head comparisons, and CBT plus medication strategies include a lack of head-to-head comparisons between groups receiving placebo only, medication only, standardized CBT only and CBT with individualized medication, and to compare the effect of CBT given subsequent to placebo and given subsequent to standardized medication.

Aims of the study

The aim of the present study was to compare outcome of therapy in four comparable groups of OCD with overt compulsions, who received one of four treatment modalities: i) standardized medication only (but who subsequently received CBT), ii) placebo only (but who subsequently received CBT), iii) CBT only, and iv) CBT following individualized medication.
Material and methods

Recruitment

All participants were recruited from the general Montreal population and screened by our three-step process prior to induction into the treatment programme. Participants were screened by telephone interview and subsequently diagnosed by an experienced specialized psychiatrist (C.T. and F.B.). Subsequently they received the Y-BOCS semi-structured interview administered by an independent trained rater who was also a certified clinical psychologist. For logistic and ethical reasons and to obtain a comparable timeline between different groups, recruitment was carried out according to two protocols. The first recruitment protocol ensured that the medication and placebo group followed the same stabilization period and both received CBT after the same time delay period. The second recruitment protocol ensured that those already stabilized on individualized SRI (administered externally and outside of the study period) received CBT at exactly the same time and for the same duration as those who were drug naïve.

The first protocol was a double-blind study where the person agreed to be stabilized and then be randomly allocated to receive 5 months of treatment on either placebo or active medication (fluvoxamine). If the person agreed they were followed by an experienced psychiatrist who adjusted for optimal dose response and then monitored the person at regular intervals over the 5-month period. The person remained stabilized on either placebo or fluvoxamine until a minimum of 5 months when they were reassessed on all baseline measures, before receiving standard CBT. All people in this first study received fluvoxamine or placebo and were not receiving any other treatments. The active and inactive medication was given in identical tablet form of 50 mg units and were identical in appearance. Both active medication and placebo were provided by the same generic company APOTEX Inc.

If participants were on current medication, with the agreement of both participant and prescribing physician, they underwent a tapering and wash-out period prior to entry into the trial. The study was double-blind and neither the psychiatrist prescribing, patient nor therapist had knowledge of whether active or placebo was administered. The code was controlled through random allocation by the hospital pharmacy who revealed the code only at the end of follow-up, or in the case of the person leaving the study for other treatment. Patients who were allocated to the placebo condition were monitored and any deterioration in state merited exclusion from the study and referral to other treatment as usual. All people in placebo or medication conditions were offered the option to be treated with the CBT protocol subsequent to the pharmacotherapy and to remain on the same dose of medication or placebo whilst receiving CBT.

In the second protocol, all participants received CBT as an initial treatment modality but were divided into two groups, the first receiving medication and already stabilized on an optimum dosage of an SRI, but still symptomatic (>16 Y-BOCS), and the second, drug naïve and receiving no other treatment. The first group receiving individually tailored medication was designed to control for the known individual differences in treatment response to any one SRI. All people on the tailored medication were already stabilized on medication and had shown some treatment response to one particular SRI and were not taking any other medication or receiving any other form of treatment intervention for OCD.

The therapy was standard CBT as recommended by Steketee (19, 20), Rachman (21), Salkovskis (22), van Oppen and Arntz (23), Freeston et al. (24), and involved cognitive challenge adapted to the person’s beliefs plus reality testing, ERP and also addressed cognitive domains of responsibility, overimportance, intolerance of uncertainty, and other cognitive distortions, using Socratic dialogue. All CBT followed optimal guidelines and lasted 20 sessions with an extra four sessions for evaluation. All six therapists (S.R., S.G., M.-C.P., V.L., S.G. and P.D.) were CBT trained and supervised by one of the principal investigators. In addition, all therapy sessions were audiotaped to monitor for treatment integrity. The pharmacotherapy period lasted between 4 and 7 months with a mean duration of 5.7 months and the CBT had a standard duration of 5 months (20 treatment sessions).

Entry criteria for all four groups were: i) a primary diagnosis of OCD (>16 Y-BOCS); ii) presence of overt compulsions for at least 1 h a day; iii) no evidence of suicidal intent; iv) no evidence of current substance abuse; v) no evidence of current or past schizophrenia, bipolar disorder or organic mental disorder; vi) not taking other medication or receiving other treatment regimes; vii) willingness to undergo randomization into the treatment modalities. Exclusion criteria were the presence of any other major pathology as identified on Axis I or II on the DSM-IV in need of treatment, the presence of any organic disorders or history of substance abuse.
If the person abandoned, they were asked to complete the questionnaires and assessment at that point in time for all treatment modalities. The total number of participants recruited into the study was 48. Number of abandon in each group were equal and totalled five. The total number of completers were placebo (n = 10), medication only (n = 11), CBT only (n = 10), CBT with medication (n = 12). However, missing data was still present on some measures.

Demographic characteristics
The mean age was 37.7 years (SD = 11.8). In terms of education: 36.4% had a university education, 30.3% higher college, 30.3% a secondary education and 3% had a primary education only. Concerning marital status: 50% were single, 40.6% were married or cohabiting, 9.4% separated or divorced (Table 1).

Measures
The main dependent variables assessed symptoms and cognitions that were direct targets of the intervention and were used to establish treatment efficacy.

Clinician assessment. All patients were diagnosed using the Anxiety Disorders Interview Schedule for DSM-IV, a structured interview that diagnoses anxiety disorders and exclusionary conditions (ADIS-IV) (25). Also, participants were administered the Y-BOCS (26, 27). The Y-BOCS is the instrument of choice for clinician assessment of OC symptoms and severity. Studies confirm the validity and reliability of the principal scales (ICC = 0.91–0.94, r_s = 0.90) (28, 29). An independent assessor administered the Y-BOCS at pre-, mid-, post-treatment and follow-ups. Following pretreatment assessment (ADIS, Y-BOCS) and before therapy, all patients received four individual 1-hour evaluation sessions. These interviews assessed hierarchy of resistance to compulsions, neutralizing strategies and obsessional inferences (see below) to be targeted (or not, depending on the treatment modality) later in therapy. The Y-BOCS, administered by a certified clinical psychologist who was blind to treatment condition and to types of treatment, and study hypotheses, was defined as the primary outcome variable.

Questionnaire symptom measures (administered pre- and post-treatment). The Padua Inventory (30) is a comprehensive 60-item self-report inventory of obsessions and compulsions. The total scale (α = 0.95) and the subscales are reliable (α = 0.75–0.91). The Beck Anxiety Inventory (BAI) (31) is a 21-item anxiety symptom checklist rating symptom

<table>
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<th>Table 1. Demographics and subtype</th>
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Predominant subtype was classified on the basis of Y-BOCS report and clinical notes confirmed by Padua subscales. All participants performed overt compulsions.
intensity for the last week on a 0–3 scale ($\alpha = 0.91$). The Beck Depression Inventory (BDI) (32) is a 21-item measure of depressive symptoms ($\alpha = 0.91$).

Cognitive measures: strength of obsessional inferences; confidence in resistance to ritual; and degree of conviction in need to perform the ritual

The cognitive structure of beliefs in OCD with overt compulsions can be divided into two components: the strength of belief in the actual obsessional doubt (ex. ‘maybe my hands are dirty’), and the anticipated consequences if the doubt is correct (ex. ‘if my hands are dirty I’ll contaminate my whole family’). Conventionally strength of belief in anticipated consequences and appraisals are taken as the key measure of insight in OCD (33). However, recent work has highlighted a subgroup for whom anticipated consequences may be negligible and initial obsessional doubt still strong. The strength of initial doubt has also been linked independently to ability to resist the ritual (34) so it was included here as an additional measure of belief. Obsessional inferences and secondary appraisals were assessed by semi-structured clinical interview with the client. Strength of conviction was recorded by the therapist for each obsession on the obsessional hierarchy scale completed pre- and post-treatment [0–10]. This clinical hierarchy also ranked all compulsions according to the self-efficacy or degree to which the person felt able to resist the compulsion on a scale of 0 (not at all) to 10 (completely). The obsessional conviction was measured (ex. my hands could be dirty) as degree of probability [0–10] (ex. how probable is it that your hands might be dirty). The anticipated consequence (ex. if my hands are dirty, I’ll contaminate my whole family) was rated according to how realistic the consequence [0–10]. Also measured was the conviction in the need to perform the ritual [0–10].

Analysis

\textit{MANOVA} was conducted on each measure over time separately so as to establish a valid overall effect prior to individual \textit{ANOVA} comparisons. Subsequent to an overall significant effect ($P < 0.05$), repeated measures \textit{ANOVA} between groups over time were computed and significant interaction effects further explored via planned comparisons. Effect sizes are represented by partial etas (small = 0.14; medium = 0.36; large = 0.51; very large = 0.70 + ). Observed power was calculated using the \textit{spss} algorithm (SPSS Inc., Chicago, IL, USA).

Cognitive behaviour therapy and medication in OCD

\textbf{Results}

There were no significant differences in baseline in demographic, predominant subtype of OCD, or clinical characteristics between the four groups (see Table 1), so characteristics of participants recruited from the two protocols were equivalent. There was no group differences at baseline and all group means fell in the severe OCD range > 25 on the total Y-BOCS (see Table 2).

\textbf{Medication only vs. placebo only}

In the initial analysis, the groups receiving medication and placebo only were compared pre- and post-treatment and subsequently the effect of administering CBT to both these groups was further evaluated. \textit{MANOVA} for medication only and placebo only showed an overall treatment effect on the Y-BOCS ($F[1,19] = 19.93; P < 0.0001$; effect size = 0.51; observed power = 0.99), an interaction trend ($F[1,19] = 3.33; P < 0.08$) indicating significantly greater change in the medication vs. the placebo group. However, mean decrease in total Y-BOCS in both groups was not clinically significant (placebo 7%, medication 15%). There was a significant decrease in the BAI ($F[1,17] = 4.46; P < 0.05$; effect size = 0.21; observed power = 0.51).

\textbf{CBT following medication only and placebo only}

After the first post-treatment evaluation period, both the placebo and medication only group were subsequently offered CBT for a further 5-month period. Two participants from each group did not complete the CBT phase. CBT was administered to each group according to the same protocol by the same therapists, and those on medication or placebo maintained the dosage and type of medication on which they had been previously stabilized. In both groups, the Padua and total Y-BOCS showed a significant decrease compared with baseline and to first post-treatment – Padua Inventory ($F[1,16] = 30.36; P < 0.000$; effect size = 0.67; observed power = 1.00); Y-BOCS ($F[1,16] = 199.60; P < 0.0000$; effect size = 0.93; observed power = 1.00) (see Table 2). There were no interaction effects indicating that there was no difference in degree of response to CBT regardless of whether the person was on medication or placebo prior to or during CBT. After post-treatment (CBT), the decrease in Y-BOCS from the first post-treatment score was respectively 44% and 57%.

The BDI also showed a significant treatment effect ($F[1,16] = 21.68; P < 0.000$; effect size = 0.57;
observed power = 0.99). There was, however, a
group difference at first post-treatment (pre-CBT)
baseline with the medication followed by CBT
condition showing lower BDI than the placebo follow-
ed by CBT group ($F_{1,16} = 7.52; P < 0.01$). There
was subsequently no differential interaction effect
in response to treatment post-CBT.

The BAI showed a similar significant effect of
treatment ($F_{1,16} = 9.30; P < 0.008$; effect
size = 0.37; observed power = 0.82). Again there
was a suggestive group effect at initial post-
treatment baseline ($F_{1,16} = 3.11; P < 0.10$) indi-
cating lower anxiety at outset in the medication
followed by CBT only group.

CBT only vs. CBT + individualized medication

In contrast to the medication only and placebo only
groups, the two groups initially receiving CBT
either with or without individualized medication
showed a clinically significant overall treatment
effect for the total Y-BOCS score ($F_{1,19} = 85.22;
P < 0.0001$); effect size = 0.82, observed power = 1.00 for the BAI ($F_{1,18} = 11.70; P < 0.003$;
effect size = 0.39; observed power = 0.89); for the
BDI ($F_{1,18} = 16.50; P < 0.001$; effect size = 0.48;
observed power = 0.97); and for the Padua ($F_{1,19} = 33.96; P < 0.0001$; effect size = 0.64;
observed power = 1.00). There were no significant
interaction effects between the two groups for any
measure, so indicating equivalent decrease in
Y-BOCS score between those receiving CBT with
(43%) or without individualized medication (53%).

Comparison between the four groups: medication only, placebo,
CBT only, and CBT plus individualized medication

The greater clinically significant impact of the two
CBT conditions over the initial medication only
and placebo only conditions was confirmed by a
comparison between these four groups pre- and
post-treatment (see Table 2). All active treatments
showed a decrease in pre–post Y-BOCS ($F_{1,38} =
105.4; P < 0.000$; effect size = 0.74; observed
power = 1.0), but the decrease was significantly
greater for the CBT only and CBT plus individua-
lized medication groups ($F_{3,38} = 13.2;
P < 0.000; effect size = 0.51; observed power = 1.00$). Looking at post hoc planned comparisons
between the groups, only the CBT groups showed a
significantly different change compared with pla-
"
obsessions and compulsions than the other two medication only and placebo only groups (see Figs 1 and 2).

Similar significant group by treatment interaction effects were found for the Padua Inventory ($F[3,35] = 3.97; P < 0.016$; effect size = 0.25; observed power = 0.79) and the BDI ($F[3,34] = 3.87; P < 0.018$; effect size = 0.25; observed power = 0.78). The group receiving medication only showed significantly less linear decrease in Padua scores than the CBT only, and CBT plus individualized medication. Effectively, depression decreased significantly in both CBT only and in CBT plus individualized medication conditions and actually non-significantly increased in the placebo condition (see Table 2).

So as to examine cognitive variables, we looked at group differences in strength of initial obsession and anticipated consequences (see Table 3). The beliefs were calculated as the mean scores on the clinical scales over the hierarchy of all reported obsessions. Both strength of obsession and belief in anticipated consequences were normally distributed. Research with a larger study has shown both measures to be independently normally distributed with both showing a satisfactory test–retest reliability 2 weeks apart (35).

Strength of obsessional conviction showed a significant group by treatment effect ($F[3,34] = 10.97; P < 0.000$; effect size = 0.49; observed power = 1.00), as did strength of anticipated consequences ($F[3,33] = 9.47; P < 0.000$; effect size = 0.46; observed power = 0.99). Both groups receiving CBT showed a significant decrease in strength of obsessional conviction and anticipated consequences but the placebo only and medication only conditions showed no significant change (see Table 3). Self-efficacy in ability to resist the ritual likewise showed a significant group by treatment effect ($F[3,34] = 19.75; P < 0.000$; effect size = 0.64; observed power = 1.00). Only the CBT groups showed a significant increase in confidence to resist the ritual, when compared with no change in the placebo and medication groups. Finally, conviction in the need to do the ritual showed a group by treatment effect ($F[3,33] = 6.89; P < 0.001$; effect size = 0.39; observed power = 0.96). The two CBT groups showed a significant decrease when compared with no change in the placebo and medication groups.

Comparison of the four groups at endpoint: medication only followed by CBT, placebo followed by CBT, CBT only and CBT plus individualized medication

ANOVA comparison of all four groups at endpoint after the medication only and the placebo only groups had received CBT revealed no significant
interaction effects for any measure, so indicating that post-CBT, all four treatment groups were equivalent regardless of previous status (see Tables 2 and 3).

Responders vs. non-responders

The group was divided into responders (> 35% decrease in Y-BOCS) and non-responders (< 35% in Y-BOCS) at first post-treatment (36). All process variables (obsessional conviction, belief in consequences, self-efficacy in resisting the ritual, conviction in need to perform the ritual), as well as Padua inventory and BAI and BDI, showed significant differences between responder groups (see Table 4).

Relationship between mood and OCD

Finally, to explore the hypotheses that medication principally affects mood states, change in mood measures (BDI, BAI) and change in clinical outcome measures (Y-BOCS, Padua) were correlated separately for medication and non-medication groups, both at first post-treatment and at endpoint after all groups had received CBT. The medication group combined those receiving medication only followed by CBT, and those receiving CBT plus individualized medication. The non-medication group combined those receiving placebo only followed by CBT and those receiving CBT only. Interestingly, at both first post-treatment and at endpoint, only in the non-medication group were there significant correlations between change in depressive mood measures and clinical change measures (see Table 5). In the medication groups there was a positive correlation between clinical change and change in anxiety, both at first post-treatment and at endpoint, but not with change in depression. In the medication group, it would seem that depressive mood and obsessions were affected independently, possibly by

### Table 4. Differences between non-responders (<35% improvement) and responders (> 35% improvement) in change on clinical and process measures at first post-treatment

<table>
<thead>
<tr>
<th></th>
<th>Non-responders</th>
<th>Responders</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y-BOCS (total)</td>
<td>25</td>
<td>-3.6</td>
<td>3.1</td>
</tr>
<tr>
<td>Padua (total)</td>
<td>22</td>
<td>-10.9</td>
<td>32.4</td>
</tr>
<tr>
<td>Beck Anxiety Inventory</td>
<td>22</td>
<td>-0.9</td>
<td>9.1</td>
</tr>
<tr>
<td>Beck Depression Inventory</td>
<td>22</td>
<td>-1.5</td>
<td>8.2</td>
</tr>
<tr>
<td>Obsessional conviction</td>
<td>21</td>
<td>-0.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Belief in consequences</td>
<td>20</td>
<td>-0.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Conviction in need to do ritual</td>
<td>21</td>
<td>-0.3</td>
<td>2.2</td>
</tr>
<tr>
<td>Ability to resist the ritual</td>
<td>21</td>
<td>6.9</td>
<td>18.8</td>
</tr>
</tbody>
</table>

***P < 0.001 **P < 0.01 *P < 0.05.
medication and by CBT as chronologically distinct interventions (see Table 5).

Discussion

The current study partially replicated past findings in the literature (37), including a previous study by the principal author and colleagues which had indicated that both medication and CBT were more effective than placebo (12). The direct comparison between medication and CBT allowed us to show that CBT alone and CBT plus medication did show significantly greater improvement than medication and placebo alone, and the addition of CBT to medication only and placebo only groups further improved clinical response in these groups. The average of 15% decrease in Y-BOCS scores following standardized medication only with a range across participants of between 10% and 45% is comparable with other studies, particularly given the recognized individual differences in treatment response (10) (33% of our sample showed ≥20% improvement).

The findings clearly indicate that CBT has a far more specific antiobsessional effect than medication. However, medication overall did not show any preferential effect compared with CBT on depression, as has been suggested by other studies, although depression was lower in the medication only group after the first treatment period compared with the placebo period. However, our group was not in a highly depressed range and decrease in depression post-CBT only was comparable with medication.

The specific antiobsessional effect of CBT was even more in evidence in cognitive measures. Only the groups receiving CBT showed a significant decrease in obsessive doubt, anticipated consequences, self-efficacy in resisting the ritual, and degree of conviction in the need to perform the ritual. The medication only group and the placebo group showed no change in any of these measures until they received CBT. If we compare the final outcome after the further 20 sessions of CBT treatment of those initially in the standardized medication (fluvoxamine) or placebo groups with final outcome of those groups initially receiving CBT in the CBT only and CBT plus individualized medication, there is no significant group difference in endpoint Padua or Y-BOCS outcome measures.

The recommendations from the study are that all active treatments improve symptoms, that CBT (with or without medication) is associated with superior antiobsessional effect to medication alone, and with a more specific effect on cognitive measures. CBT changes cognitions, and furthermore, these cognitive aspects relate also to the need to perform the ritual and to self-efficacy in resisting the ritual. The significant increase in self-efficacy in ability to resist the ritual with CBT is particularly important as self-efficacy is known in other areas to enhance outcome and prevent relapse (38). The CBT here was administered individually over 20 sessions but more cost-effective deliveries may yield comparable results (39).

The combination of CBT with individually tailored medication or with standardized medication did not seem to modify final outcome measures. Neither did those who initially received placebo differ in their response to CBT compared with those who initially received medication. However, if we consider decreases in depression as well as obsessions as indices of improved functioning, it would seem the medication combined with CBT produced superior outcome. This point was most evident in the group which had already been stabilized on fluvoxamine medication prior to CBT, and where depression scores reduced to a normal non-depressed level at final post-treatment assessment. If we combine the endpoint depression measures in both groups receiving CBT plus medication with those receiving only CBT, there is a significant advantage in

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Table 5. Relationship between change in mood and OCD symptoms for medication and non-medication groups separately

<table>
<thead>
<tr>
<th></th>
<th>Beck Anxiety Inventory</th>
<th></th>
<th>Beck Depression Inventory</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Med groups</td>
<td>N</td>
<td>Non-Med groups</td>
</tr>
<tr>
<td>First post-treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y-BOCS (total)</td>
<td>21</td>
<td>0.35</td>
<td>17</td>
<td>0.51*</td>
</tr>
<tr>
<td>Padua Inventory</td>
<td>21</td>
<td>0.54*</td>
<td>16</td>
<td>0.65**</td>
</tr>
<tr>
<td>Second post-treatment (endpoint)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y-BOCS</td>
<td>20</td>
<td>0.53*</td>
<td>15</td>
<td>0.16</td>
</tr>
<tr>
<td>Padua Inventory</td>
<td>20</td>
<td>0.26</td>
<td>15</td>
<td>0.65**</td>
</tr>
</tbody>
</table>

Mood is significantly associated with symptom change more consistently in the non-medication than the medication groups. *P < 0.05, **P < 0.01. Med, mean of the two groups receiving medication and CBT (individualized medication plus CBT and CBT following medication); Non-Med, mean of the two groups not receiving medication (CBT only, CBT following placebo).
mood change for the two CBT plus medication groups (see Fig. 3). This concurs with previous studies indicating that medication may be beneficial in the presence of severe depression. As depression in other studies has been shown predictive of outcome, this point merits consideration in deciding on treatment or combined treatment of choice.

Similarly in the case of anxiety, the effect of medication, compared with placebo in reducing anxiety, may, in cases of severe anxiety, be beneficial in aiding compliance with CBT. Although in our study CBT had an equally potent antianxiety effect to medication at post-treatment. CBT for OCD requires tolerating initially high levels of anxiety to ensure efficient ERP, and the inability to tolerate anxiety can be a limiting factor in compliance. The BAI measures cognitive and other somatic aspects of anxiety but other OCD relevant emotions such as disgust may be equally important to measure.

Limiting factors of the present study include the small number of subjects, frequently a problem in this area. The OCD group did not include all subtypes of OCD. However, the a posteriori power was robust enough to permit confident conclusions about the main findings of the differences in outcome between CBT and medication alone and their combination on cognitive and clinical measures.

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References

12. O’Connor K, Todorov C, Robillard S, Borgeat F, Brault M. Cognitive-behavior therapy and medication in the

![Fig. 3. Percentage improvement in BAI, BDI, Padua, Y-BOCS scores pre- and final post-treatment for medication (Med) (n = 22) and non-medication (Non-Med) (n = 18) groups. Change in BDI score is significantly greater in the medication than non-medication groups. Med, mean of the two groups receiving medication and CBT (individualized medication plus CBT and CBT following medication); Non-Med, mean of the two groups not receiving medication (CBT only, CBT following placebo).](image-url)
Cognitive behaviour therapy and medication in OCD
