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Habit reversal training as a treatment for refractory OCD – A case study

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Nearly 4 million American men and women from all geographic, ethnic, or economic backgrounds are diagnosed with obsessive-compulsive disorder (OCD). While a combination of cognitive behaviour therapy (CBT) and psycho-pharmaca seems successful for 50% to 60% of patients, for intractable cases the typical recommendation is more medication or more CBT, however there is little evidence that the intensified treatment regimen is successful. In this paper, habit reversal training, including awareness training, competing/other response training, self-monitoring, social support, and generalisation, was implemented with a long-term treatment-refractory OCD patient. Treatment gains and long-term maintenance indicate the potential of habit reversal procedures with these patients.

Key words: Obsessional-compulsive disorder, habit reversal, relaxation, evidence-based practice, mentalism, CBT.

According to the DSM-IV the diagnosis of Obsessive-Compulsive Disorder (OCD) is based on two components. "Obsessions are constant, intrusive, unwanted thoughts that cause distressing emotions. Compulsions are urges to do something to lessen discomfort, usually discomfort that is caused by an obsession" (American Psychiatric Association, 2000, p.1; see Kutchins, & Kirk, 1999 for a critique of DSM). Four to six million adults and almost one million children suffer from OCD in the US alone (The OCD Resource Centre of South Florida, 2004) and it is thought that at some time of their lives about 2% of the population suffer from some form of OCD (British Association for Behaviour and Cognitive Psychotherapy, BABCP, 2004).

Symptomatology

Obsessions and compulsions can occur as often as 100 times per day and in most cases the

person is aware that their behaviour is unusual (BABCP, 2004). Consequently, OCD can become a source of significant embarrassment and humiliation and potentially interferes with general daily living tasks, academic achievement, and professional conduct. Despite the fact that individuals often spend hours engaging in OCD behaviours, most people try to conceal their symptoms and experience high levels of emotional distress and problems in interpersonal relationships.

Obsessions are persistent thoughts, impulses, ideas, or images that are experienced as inappropriate or intrusive, and cause distress or anxiety. Typically, obsessive thoughts include fear of contamination, unwarranted concerns about personal safety and the safety of others, inflated sense of responsibility, or trepidations of committing violent or sexually inappropriate acts. Compulsions are repetitive behaviours, such as repeated unnecessary hygiene routines, avoidance of contact with certain household items, switching off or on of electrical appliances, locking of doors or windows, re-arranging household items, or hoarding of certain items. Compulsions can also include mental acts, such as praying, counting, or repeated silent self-talk.

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Epidemiology

By-and-large, it is thought that a complex combination of inherited biological and psychological factors causes OCD, however the detail of this remains participant to debate (Rachman, 1997; Salkovskis, 1985). For example, positron emission tomography (PET) scanning suggests that areas in the brain that play a part in other neurological disorders show neurochemical activity in OCD patients that differs from that of people with no mental illness or those diagnosed with other mental illness (National Institute of Health, NIH, 2001). Changes in brain activity have been found to coincide with treatment (medication and behaviour therapy) as well as clinical improvement (NIH, 2001). Further evidence of brain malfunction using magnetic resonance imaging (MRI) showed that patients with OCD had significantly less white matter than controls (Jenike, Rauch, Cummings, Savage, & Goodman, 1996), but it remains unclear whether brain abnormalities are cause or effect of atypical behaviours (Goddard, 2005).

While officially OCD is classified under anxiety disorders (American Psychiatric Association, 2000), cognitive theorists view OCD as a belief disorder (O'Connor, Aardena, & Pelissier, 2004), in which cognitive distortions are based on irrational and specific dysfunctional beliefs rather than on exaggeration of normal passing thoughts. Alternatively, behaviour analysts argue from a systemic and functional analytic point of view (Keenan & Dillenburger, 2004; McNamara, 1979; Novak, 1996; Sturmey, 1996) that, similar to other habit disorders, OCD has "significant operant elements maintaining it" (Thyer, 1997, p.732). This view is supported by clinical observations that in most cases, OCD follows a cyclical pattern in which compulsive actions initially lead to lessening of aversive obsessional thoughts, indicating that compulsive actions may be negatively reinforced by escape from obsessive thoughts. However, usually obsessive thoughts soon re-appear, indicating that compulsive actions in turn may function to positively reinforce obsessive thought patterns. While the specific thoughts and actions differ from one individual to another, this cyclical positive-negative reinforce-

ment trap is considered typical for the commonly observed escalation of private as well as public OCD behaviours over time. Thus, OCD could be considered as a habit disorder. Bienvenu et al. (2000) for example, suggests that OCD should be considered a spectrum disorder that includes other habit disorders, such as somatoform (e.g., body dysmorphic disorder and hypochondriasis) and pathologic grooming conditions (e.g., nail biting, skin picking, and trichotillomania).

Treatment

In the past, OCD appeared difficult or near impossible to treat (Ferguson & Taylor, 1980; Pinkerton, Hughes, & Wenrich, 1984). Traditional approaches based on psychoanalysis were largely unsuccessful. However, over recent years, a combination of psycho-pharmaca and Cognitive Behaviour Therapy (CBT) resulted in treatment becoming much more effective (OCD Centre Los Angeles, 2004). The most commonly used psycho-pharmaca are the kind of Selective Serotonin Re-uptake Inhibitors (SSRIs) that are used for patients diagnosed with depression and related disorders (Vallone, 1997). While SSRIs seem to be effective for 60-70% of people diagnosed with OCD, they are usually not effective if used in isolation and patients can suffer severe withdrawal symptoms when treatment is discontinued (Zajacka, Tracy, & Mitchell, 1997).

CBT is widely viewed as the primary psychological treatment of choice for individuals diagnosed with OCD (Expert Consensus Panel, 1997; Ladouceur, Freeston, Gagnon, Thibodeau, & Dumont, 1995). The main aim of cognitive aspects of CBT is to alter the client's irrational obsessive thoughts and beliefs so that compulsive action becomes unnecessary (Albert Ellis Institute, 2005). The most commonly used behavioural strategy involves Exposure and Response Prevention (ERP; Foa & Kozak, 1986; Lindsay, Crino, & Andrews, 1997). ERP is based largely on principles of classical conditioning, using flooding and/or counter-conditioning (Watson, 1924) and systematic de-sensitisation (Wolpe, 1958). ERP for OCD patients usually includes exposure to a hierarchy of obsessions and the requirement to prevent responding to these thoughts with com-

pulsive action. This is achieved through in vivo practice during the therapy session and homework tasks. In cases where in vivo therapy is impossible or impractical, imaginal exposure is used for which short stories based on obsessions can be audio taped and then replayed for exposure.

While about 25% of patients refuse CBT or ERP, it seems effective for about 75% of those who engage in 10-20 outpatient sessions. There is an acknowledged risk of relapse in about 25% of these patients. Fisher and Wells (2005) confirmed that ERP seems to be the most effective treatment (50-60% recovery rate), however when "asymptomatic criterion is used as the index of outcome, ERP and cognitive therapy have low and equivalent recovery rates (approximately 25%)" (p 1543).

So, what is to be done to help patients who do not respond to this kind of treatment? While there may not be complete consensus, to-date the expert advice to clinicians is to use augmented medication and/or more CBT (Expert Consensus Panel, 1997). Although viewed as third line treatments, the expert advice in extreme cases is that it may be necessary to use neurosurgery (internal capsulotomy), monoamine oxidase inhibitors (MAOI), or electroconvulsive therapy (ECT), all of which, they admit, have extremely severe and manifest side effects (Expert Consensus Panel, 1997). This obviously is a highly unsatisfactory state of affairs. There clearly is a need to find and/or develop effective treatment for these patients that does not include more of the same (or similar) CBT or highly toxic medication, electric shock, and surgery.

Habit Reversal Training (HRT) has become the treatment of choice for habit disorders such as tics, Tourette Syndrome, and trichotillomania (Miltenberger, Fuqua, & Woods, 1998). First developed by Azrin and Nunn (1973), this comprehensive treatment protocol is firmly based on behavioural analytic principles and includes the following components: awareness training, competing response training, self-monitoring, social support, and generalisation training (see details below). In some cases not all of these components are necessary (Woods, Miltenberger, & Lumley, 1996). While not unknown in the management of ODC (Claiborn & Pedrick, 2001; OCD Action,

2005), HRT is not routinely used with OCD patients and there are no detailed descriptions or published evidence of effectiveness. In this paper, the potential of HRT with a treatment refractory ODC patient is explored.

Participant

The participant was a 28-year old woman (Nancy), diagnosed with OCD for the past 10 years. Nancy lived with her husband (Andy) in a new bungalow in a residential estate in a small town. They met 8 years ago and married two years later. At that time Nancy had minor OCD symptoms. They had no children.

Nancy's OCD symptoms increased over recent years and, for two years prior to the beginning of the present study, she was under the care of a psychiatrist, who prescribed high doses of psychopharmaca. During this time Nancy also received weekly CBT and ERP from a state employed community psychiatric nurse (CPN), who had received training in CBT. As part of this treatment, she collected extensive frequency and intensity scores for obsessional thoughts and compulsive actions (two large ring binders!). However, because these recordings were not dated, it was impossible to identify daily frequency, high-risk time of day, or functional relations.

During the year prior to the beginning of this study, depressive and suicidal thoughts became intrusive. According to Nancy, the onset of suicidal thoughts occurred when the psychiatrist said that OCD could not be cured and that she would have OCD for the rest of her life. Nancy explained that she did not want a life of OCD and could not "go on like this".

Due to severe depression and danger of self-harm, Nancy had been hospitalised for two 3-month periods at the local hospital's psychiatric inpatient unit. She had spent one month at home between hospitalisations. On Nancy's own request, she had received ECT during her second stay; Andy had consented to this treatment only reluctantly. According to Nancy, ECT had no effect. Due to her acute depressive and suicidal thoughts, Nancy was due to be hospitalised for a third time two days after the beginning of this present study. Clinical observation showed that

OCD symptoms caused Nancy significant distress (she spent long hours crying after each OCD episode), took up more than 8 hours per day (she reported constant intrusion), significantly interfered with work (Nancy had lost her job), had detrimental effects on her marital relationship (Andy was planning to leave her), and hindered normal daily functioning (Nancy often could not leave the house). Nancy recognised that her obsessions and compulsions were not rational and were excessive. On the Yale-Brown Obsessive Compulsive Scale (Y-BOCS) Nancy had an overall score of 33 at the beginning of the study and therefore was placed in the extreme range (mean for OCD population = 25.1; SD = 6; Goodman, Price, Rasmussen, & Mazure, 1989).

Procedure

In total twelve treatment sessions were conducted; six weekly sessions were followed by four fortnightly sessions and two monthly sessions. This was followed by a period of 6 months during which Nancy sent self-monitored data to the therapist on a monthly basis. The therapist entered the data into the data bank and sent a printout of the graphed data back to Nancy together with an encouraging note, such as "Thanks and well done", "Graphs looking good!" A follow-up visit took place after 6 months. A brief follow-up meeting took place 18 months after treatment ended. Treatment took place in Nancy's own home, to allow for immediacy, applicability, and generalisation.

Each treatment session lasted for approximately 60 minutes. The first 50 minutes of each session were spent with Nancy alone and the last 10 minutes with Nancy and Andy. In the first 10 minutes of each session data collected during the past week were discussed with Nancy (see below for details on data collection). This was followed by 30 minutes of HRT exercises (see below for detailed description). A brief discussion of exercises with Nancy (10 minutes) was followed by a joint discussion of progress and homework task with Nancy and Andy (10 minutes).

HRT treatment included the following components. Initially, *awareness training* started with a functional assessment interview (O'Neill, et al., 1997) to establish a clear definition of obsessions

(e.g., 'freezer door is left open and all food will be destroyed'; 'back door is left open and burglar will come in'; 'put sewing needle into Andy's sandwich and he eats needle') and compulsions (e.g., checking freezer door is closed, cooker is switched off, back door is locked, fire is extinguished, sewing needles are in cupboard). Nancy was taught how to recognise these private as well as public behaviours and record frequency of their occurrence.

Awareness training also included teaching Nancy about contingency assessments, in other words, to recognise antecedents, e.g., when these behaviours occurred (i.e., time of day), who was present, and where these behaviours occurred (i.e., location), and consequences, i.e., who did what afterwards. Nancy reported that most of OCD related behaviours occurred when she was in the home alone (when Andy was at work); fewer OCD related behaviours occurred when she was with Andy or his mother outside their home. Nancy reported that after each OCD episode she was very upset and that she spent many hours crying; Andy and his mother were sympathetic, patient, and compassionate.

In terms of *competing response training*, it is difficult to identify competing muscle responses, therefore relaxation was considered the most appropriate alternative response to be trained. Relaxation behaviours can be carried out for long durations and in different environments without risk (Dillenburg & Keenan, 2003). Relaxation exercises were carried out with Nancy on her own in each session. These exercises were similar to those used in hypnotic induction (Waxman, 1989). Nancy was sitting on the sofa and asked to make herself comfortable, close her eyes, slow down her breathing, and concentrate on each body part in turn. Starting with the top of her head working down to her toes, she was instructed to relax each body part in turn. When Nancy felt very relaxed, as indicated by her facial muscles softening, her breathing slowing, her arms flopping, she was asked to engage in one of her obsessive thoughts (i.e., imaginary exposure). When tensing of body was observed (e.g., making a tight fist, reddening around the neck), instruction to engage in competing/alternative responses (i.e., relaxation) were given (e.g., "take a deep breath", "relax deeper", or "imagine a favourite

calm place”) until Nancy showed physical signs of relaxation (e.g., arms flopping, redness fading) while reporting to have obsessive thoughts.

Furthermore, in-session reinforcement (Kohlenberg & Tsai, 1991) was used when Nancy reported improvements in OCD related behaviours. For example one day in week 9, Nancy forgot to lock a window before she left the house; highly atypical behaviour due to her usual compulsion to check windows numerous times before leaving the house; she got very upset and cried for hours. The therapist congratulated Nancy and praised her for engaging in such normal and ‘healthy’ behaviour (“This is a real sign of you getting better. Healthy people forget to lock windows at times; people with OCD don’t”). Nancy was surprised at the therapist’s response and when Nancy forgot to lock a door the following week she cried for ‘only’ 2 hours. Again the therapist praised Nancy for normalcy of behaviour; “Well done. I forget to look my door at times. Look at how much better you coped this time”. The next time Nancy forgot to lock a door a few weeks later, she reported that she did not get upset; “I simply laughed at myself”.

Self-monitoring was agreed in relation to a homework task. Initially, Nancy was to engage in a one-minute relaxation exercise after each obsessive thought; in order to establish a baseline for relaxation, no reinforcers were used during the first week. Following this baseline week, Nancy and Andy were asked to establish a reinforcer menu, a list of potential reinforcers (not costing a lot of money!). Their list included: having a cup of coffee, eating a biscuit, watching a favourite TV program, listening to favourite music, or going to cinema or dinner. Nancy was to engage in one-minute relaxation after each obsessive thought

and, if successful, she was to self-administer a small reinforcer from the reinforce menu (e.g., coffee, biscuit, TV time). If she engaged in the compulsive action after this, she was simply to record, e.g., how often she ‘checked’. The criterion for duration of relaxation was increased from 1 minute to 2 minutes once performance was stable.

Data recording sheets were designed (Figure 1) that included time and date, frequency scores of obsessive and compulsive behaviours, duration of relaxation, and reinforcer.

Andy was included in relation to offering *social support*. At the end of each session Andy joined Nancy and the therapist for 10 minutes to discuss progress over the past week and explore plans for the incoming week. Andy, Nancy, and therapist re-viewed the graphs together (see result section). This involvement was important to show Andy how treatment was progressing. If and when Andy noticed improvements in Nancy’s OCD related behaviours, a larger reinforcer from the reinforcer menu was self-administered (e.g., they went for dinner or to the cinema).

Generalisation training was carried out in relation generalised stimulus control. There were many stimuli in the home that were not related to OCD and Nancy learned that these could become controlling stimuli for obsessions. She learned to identify the early stages of these stimuli gaining control over obsessive thoughts and how to prevent this from happening through using relaxation at an early stage. For example, she reported never to have had obsessive thoughts about a particular vase on the fireplace, but one day she started obsessing that the vase would go on fire. She recognised this as stimulus control and was able to stop this initial thought before it developed

Date and time	Obsessive thought	Duration of relaxation	Reinforcer	Compulsive action
12/10/2003 10.30 am	‘freezer door open; food destroyed’	1 ½ minutes	cup of coffee	checked 4 x
11.00 pm	‘backdoor unlocked; burglar come in’	2 minutes	biscuit	no check (backdoor had been locked at 10.45 pm)

Figure 1. Self-monitoring data-recording sheet

a full-blown obsession-compulsion relation.

Follow-up was conducted for 6 months after treatment sessions had been terminated. During follow-up, data recording sheets were sent to the therapist on a monthly basis. The therapist graphed the data and sent the updated graphs back to Nancy, together with a brief written note with encouraging feedback, such as “Well done”, “Graphs looking great”, “Keep the good work up”. A final visit was conducted at the end of the 6-month period.

Eighteen months after treatment had finished a brief meeting was held to assess maintenance of treatment gains.

Results

Figure 2 shows average daily duration of relaxation after each obsessive thought. The initially agreed target criterion for duration of relaxation was one-minute. During baseline, when no reinforcers were used, criterion was met on 3 out of 7 days. During the following 15 days when reinforcers were made contingent on relaxation criterion was reached 100%.

The duration criterion for relaxation was increased to two minutes in the forth treatment session. During the following 17 days (weekly

sessions) the two-minute criterion was reached on only 3 days (18%) however, duration of relaxation never dropped below one minute. For the next 56 days (fortnightly sessions) criterion was reached on 18 days (32%). During the following 56 days (monthly sessions) criterion was reached on 44 days (79%). Criterion was reached 100% during the 135 days of treatment follow-up.

Figure 3 shows self-recorded frequencies of obsessive thoughts and compulsive actions throughout treatment. During baseline all obsessive thoughts were followed by compulsive actions (days 0-7), for the following 17 days (weekly sessions) on average 31% of obsessive thoughts were not followed by compulsive actions; during the next 56 days (fortnightly sessions) this increased to an average of 53% and for the following 56 days (monthly sessions) this increased to 74% of obsessive thoughts not followed by compulsive actions. During 135-day follow-up an average of 86% of obsessive thoughts were not followed by compulsive actions (total of 286 days). These data exclude 14 days during follow-up, when Nancy and Andy were on holidays.

The frequency of obsessional thoughts initially increased from a daily average of 14 during baseline (range 13-20) to 16 during weekly sessions (range 9-25), however, returned to 14 during fort-

Figure 2. Daily average duration of relaxation after each obsessive thought (days 1-22 target duration one minute; days 23-286 target duration two minutes).

nightly sessions (range 9-22), reduced to 11 during monthly sessions (range 2-17), and reduced further to an average of 9 obsessional thoughts per day, during follow-up (range 7-14).

The frequency of compulsive actions reduced during treatment from a daily average of 14 during baseline (range 13-20), to 11 during weekly sessions (range 4-20), 7 during fortnightly sessions (range 3-11), 3 during monthly sessions (range 0-9), and 1 during follow-up (range 0-5).

On the Yale-Brown Obsessive Compulsive Scale (Y-BOCS; Goodman, Price, Rasmussen, & Mazure, 1989) the average score at the end of treatment score was 10, which is in the mild range.

Furthermore, self-reported treatment outcomes included reports of suicidal thoughts having ceased completely, planned hospitalization not being necessary, depressive thoughts having decreased dramatically, and marital separation not taking place. At 6-month and 18-month follow-up psychopharmacological prescriptions had been reduced and treatment gains were maintained. Nancy and Andy both reported rising levels of self-esteem and self-efficacy, and more realistic sense of responsibility for Nancy, and increased marital happiness.

Discussion

OCD is difficult to treat and while methods have been developed that seem effective for many patients, for a significant number of people these treatment may not be successful. In this study, we explored the potential of HRT with a patient diagnosed with OCD who despite long-term treatment with CBT and psychopharmaca had not improved. In fact, symptoms were deteriorating and she had developed co-morbid depression with suicidal tendencies.

A habit reversal treatment procedure was implemented with the result that frequency and duration of competing/alternative responses increased, while frequency of obsessive behaviours reduced substantially and frequency of compulsive behaviours reduced to near zero. In order to ensure treatment maintenance, treatment density was decreased relatively early, while treatment integrity was remained. Co-morbid conditions had all but disappeared at the end of treatment. Treatment gains were maintained over an 18-month period.

These findings point towards important implications. First, HRT was highly effective in this case and should be further explored with patients

Figure 3: Frequency of obsessive thoughts (top) and compulsive actions (bottom) through out treatment

with OCD. One of the main advantages of HRT over ERP is that functionally speaking reinforcement contingencies (increasing probability of behaviour) rather than punishment contingencies (reducing behaviour) can be used (Dillenburg & Keenan, 2003). In behaviour analysis, working within reinforcement contingencies always is the preferred option. In this case, we concentrated on increasing alternative responses (relaxation) rather than preventing target responses (as in ERP). This approach should be fully explored in a larger study of treatment refractory patients with OCD.

On a more conceptual level, the question arises what exactly is going on during therapy in terms of basic behavioural mechanisms (Marr, 2005). All of the procedures used presently with OCD patients are multifaceted and when used in different research/treatment settings are open to questions regarding treatment integrity. In order to determine the basic behavioural principles that are in operation we need a comprehensive component analysis. While this was not the aim of the present research it has become obvious that terms such as CBT, ERP, and HRT are umbrella terms for a wide range of treatment components that on their own may or may not be sufficient to treat OCD patients successfully. A thorough component analysis would prevent the use of marketed treatment packages that all too often are used 'off the shelf' instead of being based on scientific principles, functional analysis, and individually tailored, data based decisions carried out by well-trained clinicians.

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