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ORIGINAL ARTICLE

Intensive Behavior Therapy for Tics: Implications for Clinical Practice and Overcoming Barriers to Treatment

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Abstract This case study illustrates the treatment of an individual diagnosed with Tourette syndrome (TS) treated with a behavior therapy (BT) protocol adapted from Woods and colleagues (2008). The client was a 25 year old, male who traveled from his country of origin for 2 weeks of intensive treatment for complex tics. The tics included multiple body movements and vocalizations that were both distressing and impairing. BT for tics is typically implemented weekly over the course of 10 weeks, and the efficacy of this regimen with adults has been demonstrated in several clinical trials (e.g., Wilhelm et al. American Journal of Psychiatry 160:1175–1177, 2003). In this report, we outline the case of a treatment-seeking adult with TS for which practical considerations necessitated a consolidated, intensive BT protocol involving massed rather than traditional spacing of sessions. To our knowledge, this is the first report of intensive BT for an adult with TS. Specific modifications to the protocol, as well as the specific steps for intensive BT, are discussed within the context of this client's unique circumstances. Clinical considerations for intensive treatment for TS are also discussed.

Keywords Tourette syndrome · Habit reversal · Behavior therapy · Massed treatment

Tourette syndrome (TS) is a neurological disorder characterized by motor and phonic tics. Although pharmacological interventions have generally been considered the first-line treatment for tics, a substantial portion of individuals discontinue medication due to unwanted and unpleasant adverse reactions (Piacentini and Chang

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2001). At the same time, there has been growing empirical support for behavior therapy as an adjunct or alternative to pharmacotherapy (Cook and Blacher 2007).

Behavior therapy (BT), particularly habit reversal training (HRT), has been the most rigorously studied psychotherapy for managing tics and TS. HRT (Azrin and Nunn 1973) is a multi-component treatment. The core components consist of awareness training, self-monitoring, and competing response training, which are often augmented by psychoeducation about tics, a function-based assessment and intervention to modify situational triggers that exacerbate tics, and relaxation training (Woods et al. 2008). Randomized controlled trials have consistently shown BT protocols utilizing HRT to be effective for reducing tics, either in conjunction with or instead of medication (e.g., Azrin and Peterson 1990; Deckersbach et al. 2006; O'Connor et al. 2001; Piacentini et al. 2010; Verdellen et al. 2004; Wilhelm et al. 2003).

Evaluations of BT for tics have typically examined protocols that employ weekly sessions. This format of service delivery is commonplace among BT therapists in clinical practice, as it meets the practical needs of most therapists and patients and allows for between session learning and mastery of skills (Rees et al. 2005). Nonetheless, the spacing of sessions in this manner may not be feasible for some clients suffering from tics or other disorders. For example, individuals with severe TS who are consequently unable to work, or those who lack access to well-trained BT therapists in their geographical areas, may benefit from a more intensive treatment in which sessions are condensed over a shorter period of time ("massed" sessions).

To our knowledge, there have been no studies demonstrating the efficacy of BT for the management of tics administered in an intensive format. However, the effectiveness of intensive treatments has been evaluated for other disorders. For example, Deacon and Abramowitz (2006) investigated BT for panic disorder that involved 9 h of therapist contact over 2 days and found clinically significant reductions in panic symptoms and anxiety sensitivity at post-treatment, with gains maintained at 1-month follow-up. Although the study was limited by a small sample size, nonrandomized design, and short follow-up period, the authors note that the effect sizes for treatment were comparable to those from large randomized controlled trials. Results of randomized controlled trials directly comparing weekly to intensive protocols, however, have been mixed. Although some studies have found no differences between massed and spaced sessions (e.g., Foa et al. 1980; Storch et al. 2007), others have found evidence for a lapse in gains following massed treatment. In particular, Abramowitz et al. (2003) compared twice weekly versus daily sessions of exposure and response prevention for obsessive-compulsive disorder. Although the daily-session condition (i.e., massed sessions) outperformed the twice-weekly condition at post-treatment, there were no differences between the groups at long-term follow-up. It is noteworthy that differences at long-term follow-up seemed to diminish due to a partial lapse in gains among those who received the massed treatment. Rowe and Craske (1998) also found that individuals treated with massed sessions of BT for spider phobias experienced faster initial reductions in symptoms, but poorer long-term follow-up, compared to those treated with spaced sessions.

Research indicates that one way to improve long-term outcomes following intensive treatment may be through the use of maintenance programs. Ost (1989) designed a maintenance program for the treatment of specific phobia that was introduced to clients during the final session of treatment. This multi-component

program consisted of a thorough review of the course of treatment, psychoeducation about setbacks versus relapse, written statements regarding the course of action to take in the case of a setback, continued completion of practice forms, and, if necessary, post-treatment telephone contact with the therapist. In describing his maintenance program, Ost reviews results of his studies indicating that clients who received BT with a maintenance program were less likely to require relapse and/or additional treatment, compared to clients whose treatment did not incorporate a maintenance program. Such a programs could also be adapted and incorporated into intensive treatment protocols for other disorders, including tics.

The absence of a definitive answer from the literature regarding the efficacy and feasibility of massed BT for TS leaves therapists without sufficient empirical guidance when practical considerations merit massed treatment. Accordingly, this case report illustrates intensive BT (i.e., HRT) for an adult male diagnosed with TS. To meet the unique needs of this client, treatment consisted of a massed version of BT for tics adapted from the protocol by Woods and colleagues (2008). Rather than weekly sessions (as outlined in Woods and colleagues), treatment was administered in a massed format over the course of 2 weeks. Given the concern about relapse, a maintenance program based on the recommendations of Ost (1989) was also incorporated. Although empirically validated protocols are generally eight to ten sessions, the current case utilized seven sessions in order to mirror the protocol of Woods and colleagues (2008) as closely as possible given the time constraints, while still allowing for between session therapeutic activities.

Case Presentation

Relevant Background and Context

The client was a 25 year old, single male who traveled from his country of origin for 2 weeks of intensive treatment at a university-based community outpatient clinic specializing in the treatment of TS. At the time, he was studying at a university and had an occupation that prevented him from coming to the United States for prolonged treatment. The client reported first exhibiting tics when he was 8 years old, with their becoming more severe over time. His major impetus for seeking treatment at this clinic was concern about his inability to control his tics in public, and the frequent teasing and stigmatization that he experienced. The client reported unsuccessful pharmacological and psychological treatment in his country of origin. More specifically, he stated that taking medication for his tics caused substantial weight gain, which made him uncomfortable with how he looked, and that after seeing multiple psychologists, he concluded that therapists in his country lacked expertise in the treatment of tics. He was proficient, but not fluent, in English, and was accompanied by his sister for occasional assistance with translation and for social support.

Assessment and Diagnosis

A thorough assessment consisting of a clinical interview and semi-structured, clinician-administered interviews was conducted to confirm a TS diagnosis, identify

potential obstacles to treatment, and develop a case formulation. On the Yale Global Tic Severity Scale (YGTSS), the client obtained a total tic score of 43/50, indicating severe TS. As the client exhibited complex tics at least every 2 min during session, his YGTSS score was convergent with his presentation. The client's score of 10/40 on the Yale-Brown Obsessive Compulsive Scale (Y-BOC) indicated mild obsessions and compulsions which were unrelated to his tics. For the purpose of monitoring treatment outcome, at each session, the client provided ratings of the subject distress associated with each of his tics.

Course of Treatment

Following the initial evaluation, the client was seen for seven, 60–75 min sessions over the course of 2 weeks. During this time, he received multi-phased BT by this paper's first author.

Phase I: *Psychoeducation.* Treatment began with psychoeducation to help the client understand the course of TS. An extended amount of time was devoted to discussing realistic expectations about the most likely treatment outcomes, with a particular emphasis on the notion that BT will help to better manage, but not eliminate, tics. Psychoeducation was the focus of the first session and was incorporated throughout the subsequent sessions.

Phase II: *Identifying target tics*. Following psychoeducation, targeted tics (defined below) were identified based on the frequency with which they were exhibited, both in and out of session, as well as the associated subjective distress. The first targeted tic (Tic 1) was identified during the second session, and was the focus of treatment for sessions 2–4, although it was monitored through session 7. The second target tic (Tic 2) was identified in session 5 and monitored during sessions 6–7.

Phase III: *Habit Reversal Training (HRT).* HRT included self-monitoring (SM), awareness training (AT), competing response (CR) training, and a discussion about the role of social support. During SM, the client was asked to attend to and tally each of his targeted tics during a specified 30-min period of time each day. AT and CR training were completed in-session and assigned as homework, with the help of the client's sister for social support. As the client's primary complex tic (Tic 1) included arm, hand, and finger movements, coupled with a powerful neck jerk and vocalization, he was provided with multiple CRs, including neck tensing, and crossing his arms across his chest and tensing his fingers around them or placing his arms and fingers tightly by his side. For the vocalization component of Tic 1, the client was instructed to engage in controlled breathing, inhaling through the mouth and exhaling through the nose. As is common in TS (Leckman et al. 1993), the client reported a premonitory urge which set the complex tic in motion. As such, he was instructed to engage in the CRs in response to the urge to tic. In response to Tic 2, an arm movement towards his face while making a facial grimace, the client was instructed to gently purse his lip together while tensing his arm by his side. HRT was conducted during sessions 2–6.

Phase IV: *Function-based assessment and intervention.* This component of treatment focused primarily on identifying events or situations which precipitate or exacerbate tics (i.e., antecedents). Based on the analysis, interventions were devised to prevent antecedent events from occurring, lessen the likelihood that antecedent situations will worsen tics, and/or minimize the client's own negative reactions to the onset of tic bouts (Woods et al. 2008). The client believed that he was stigmatized as a result of his tics, particularly when he was in public places (e.g., the classroom) or meeting individually with authority figures (e.g., professors), and subsequently became anxious about his tics. As a result, the client was encouraged to utilize relaxation and review his CR just prior to entering these situations. Once in these situations, he was coached to provide a brief explanation about his tics and/or to excuse himself briefly to a predetermined safe place (e.g., restroom) to tic, if necessary.

Phase V: *Relaxation*. The client was taught deep breathing and progressive muscle relaxation, which was introduced only briefly in session 6 due to time constraints.

Phase VI: *Skill generalization and relapse prevention*. Although a component of any behavior therapy for tics, this area received particular attention given the intensive nature of treatment. To maximize the likelihood of skill generalization, the therapist assisted the client in identifying and imagining high-risk situations and coming up with and engaging in the related CRs. The client and therapist also outlined a list of the steps to implement a CR as well as a written plan for how to deal with a relapse in general, and the client was given a copy of the treatment workbook (Woods et al. 2008). The client was instructed to continue monitoring and recording his use of tic management strategies upon returning to his country of origin, referring to the list of strategies he wrote for guidance, and to contact the therapist via phone or e-mail should any difficulties arise. He was also directed to identify a supportive individual who would remind him to engage in his management strategies. Ensuring the client had a clear understanding of HRT procedures and the generalizability of HRT across tics and situations was emphasized throughout sessions 2–6, and given particular emphasis in session 7.

Phase VII: *Follow-up.* Booster sessions, to be conducted via Skype web-based video-conferencing (www.skype.com), were scheduled for 2 weeks following the client's return home. The booster sessions were recommended in order to facilitate problem-solving related to social support, utilization of treatment strategies, or any other difficulties the client encountered post-treatment.

Treatment Outcome

Over the course of treatment, the client reported a significant reduction in subjective distress associated with his tics (Fig. 1). In addition, as evidenced by SM assignments conducted in 30 min intervals, Tic 1 experienced an initial increase,

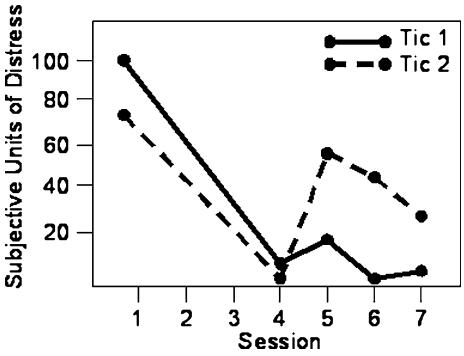

Fig. 1 Client-reported distress associated with Tic 1 and Tic 2

perhaps due to an increased awareness, followed by a sharp and sustained decrease in frequency (Fig. 2). The frequency of Tic 2, which was relatively low at the start of treatment, remained stable throughout treatment. Given the limited time frame for treatment, the YTGSS was not administered post-treatment.

With regard to the acceptability of treatment, the client was receptive to all aspects of treatment and reported satisfaction with its outcome at the conclusion of the massed sessions. In particular, he reported psychoeducation and HRT to be the most helpful. The client was initially distraught and tearful when informed during the psychoeducation phase that HRT would not *cure* his tics, but only help him to better *manage* them. However, he later expressed appreciation for this knowledge, which he believed allowed him to accept the presence of his tics and begin to focus on their management. The client also reported extremely high satisfaction with treatment outcome, saying things like, "I can control my tics for the first time in my life, even when anxious and with strong impulses."

Although booster sessions were agreed upon at the final in-person session, the client did not initially respond to e-mails regarding scheduled sessions. Approximately 5 months post-treatment, the client contacted the therapist via e-mail, and a booster session was conducted via Skype videoconferencing. At the time, the client reported a lapse because he had been unable to implement the HRT procedures consistently after returning home. He also noted that he was living in a college dormitory and lacked close social supports. The session focused on identifying

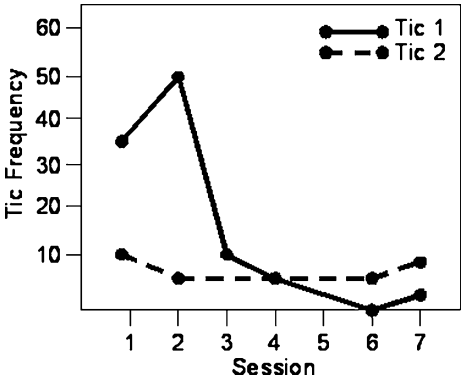

Fig. 2 Client-reported frequency of Tic 1 and Tic 2

social support, reviewing and re-implementing HRT procedures, and problem-solving around high-risk situations. The client maintained his previously expressed satisfaction with treatment and confidence that he could overcome the lapse, but specific follow-up data was unavailable.

Discussion

The preceding case demonstrates that HRT procedures can be taught and implemented in a consolidated period of time, and in an acceptable manner, for an adult with complex tics. The case also illustrates how a structured, empirically-supported treatment manual can be adapted to meet the unique needs of a given client.

Based on the large catchment area which our clinic serves and on data from survey studies of mental health practitioners nationally, it appears that there are very few therapists with expertise in providing HRT for tic disorders (Marcks et al. 2004). As a result, individuals seeking behavior treatment for TS or tics may not have access to a therapist within a feasible travel distance. Although relocation for an extended period of time in order to receive weekly treatment is not feasible for most clients, this case study indicates that traveling to a specialty clinic for intensive, short-term treatment may be a promising alternative for a distressed and motivated client.

Despite the overarching success of acute treatment, this case study also highlights an important pitfall which has implications for therapists who provide intensive treatments. Although the client showed a substantial reduction in tics and distress at post-treatment, his gains were not maintained well at follow-up. This is in contrast to several studies showing strong maintenance of gains following standardized (weekly) BT/HRT (see Himle et al. 2006, for a review). Convergent with Schmidt and Bjork's (1992) theory on the acquisition and retention of learned information, the generalization and maintenance of gains require consistent manipulation of situations, settings, and affective states. Opportunities to utilize strategies across different experiences are limited when treatment is delivered intensively, which could attenuate long-term outcomes; this prediction is consistent with results from larger controlled trials of massed treatments for other disorders (Abramowitz et al. 2003; Rowe and Craske 1998). Nevertheless, as treatment for this client took place in an entirely different context from his natural environment, it is also possible that his lapse may have been even more pronounced than that of an individual seeking intensive treatment closer to home.

These results may also underscore the importance of conducting booster sessions, especially when individuals are seeking treatment that is both massed in dose and away from their everyday context. At the same time, these results draw attention to the practical difficulties of maintaining contact following termination with clients who travelled long distances for intensive treatment. One possible solution to these problems is to more formally incorporate the maintenance program, including booster sessions, into the treatment protocol. Emphasizing their importance on a practical level, booster sessions might be scheduled and paid for in advance of the final in-person session, in order to increase the likelihood of compliance.

Another obstacle which relates to follow-up for intensive treatment concerns the medium of contact. From the perspective of both therapists and clients, numerous studies have found that therapy conducted via telephone, internet, or videoconfer-

encing is an effective, relatively feasible, and acceptable means of providing mental health treatment to individuals who may otherwise lack access to care (see Richardson et al. 2009, for a review). This therapist selected Skype, an internet-based video calling software, to conduct the booster session. Skype is advantageous because it allows for both voice and video contact, is user-friendly, and is free. During the contact, sound quality was good; however, video quality was poorer, making the visual assessment of tics more difficult. Given the inherent benefit of visual assessment in the behavioral treatment of tics, more advanced videoconferencing equipment would be better suited for booster sessions for tics, and certainly for behavioral treatment, yet this would also require substantial financial investment. Although the quality of Skype videoconferencing was adequate for a convenient and cost-effective booster session, specialty clinics or individual therapists looking to integrate intensive treatments into their practice would benefit from investing in more refined technology for follow-up sessions. Recent pilot data has shown videoconferencing with more advanced equipment to be an efficacious, acceptable, and feasible method for delivering HRT (Himle et al. 2010).

While this case study contributes to the literature on the treatment of tics utilizing intensive behavior therapy, several limitations should be noted. First, results are based on a single case study, which limits the generalizability of the findings. Second, the study did not utilize objective post-treatment outcome measures, such as clinician-administered interviews or videotaped recordings, to assess tic frequency, nor were specific measures used to assess treatment satisfaction or the quality of the technology. Third, long-term follow-up data were not available. Future research examining the efficacy, acceptability, and feasibility of intensive treatment should utilize larger sample sizes and objective assessment measures at pre-treatment, post-treatment, and follow-up.

As a final note, TS is often concomitant with other psychological disorders (Jankovic 2001) and causes significant impact on one's family and social life. Thus, although intensive HRT may help individuals to better manage their tics, a brief, massed approach may not provide sufficient opportunity to address the numerous psychosocial issues that also affect individuals with TS. However, given the functional impairment of tics themselves and the absence of empirical research to support intensive behavior therapy interventions for tics, the current paper provides initial support for the use of massed treatment and suggestions for clinicians treating clients whose practical limitations necessitate a more consolidated treatment regimen.

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