



Review

Behavioural treatment of tics: Habit reversal and exposure with response prevention

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ABSTRACT

Behaviour therapy has been shown to be an effective strategy in treating tics; both habit reversal (HR) and exposure and response prevention (ER) are recommended as first-line interventions. This review provides an overview of the history, theoretical concepts and evidence at present for HR and ER. In addition, treatment manuals for HR and ER are described. Despite the evidence and availability of treatment manuals, many patients do not receive a first-line psychological intervention for tics. Barriers to the acceptance and dissemination of behaviour therapy are discussed as are ways to overcome these barriers, such as the use of E-health and E-learning.

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1. Introduction

In the treatment of tic disorders, pharmacotherapy is the commonly used strategy. Patients are mostly referred to medical specialists (e.g. neurologists, psychiatrists and pediatricians) and often receive antipsychotics to reduce tics. In Europe, risperidone has shown to be the most applied agent in tic disorders, with

an A-level of evidence (Roessner et al., 2011). Although rather effective in reducing tics, risperidone and other antipsychotics are associated with a wide range of adverse effects including sedation, weight gain, orthostatic hypotension and extrapyramidal side effects. Many patients are reluctant to take antipsychotics and up to 70 percent of patients discontinue medication regimes within the first year (Shapiro and Shapiro, 1993).

Behaviour therapy has shown to be an effective strategy in treating tics as well (Cook and Blacher, 2007). Recently published European clinical guidelines for Tourette syndrome (TS) and other tic disorders offer a review of different behavioural and psychosocial interventions (Verdellen et al., 2011a). Both habit reversal (HR) and exposure and response prevention (ER) are recommended as first-line interventions for tics. To date, studies comparing the

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effectiveness of pharmacotherapy and behaviour therapy in tic disorders are absent. Despite this lack in research, the European guidelines recommend to start treatment with psychoeducation and behaviour therapy (HR or ER) because of the better long term effects beyond the duration of treatment and assumed fewer side effects. If these interventions are insufficient or not available, then pharmacotherapy is recommended (Roessner et al., 2011).

The present article presents an outline of the history and theory of HR and ER, the available evidence and treatment manuals for HR and ER. However, despite growing evidence and availability of treatment manuals, many patients do not receive a first-line psychological intervention for tics (Verdellen and van de Griendt, 2012; Woods et al., 2007). Barriers to the dissemination and implementation of behaviour therapy are discussed, as are ways to overcome these barriers.

2. Habit reversal (HR)

2.1. History and theory

Habit reversal is one of the oldest and most researched interventions for tics. Azrin and Nunn presented the technique in 1973 as a method for eliminating nervous habits and tics. They viewed tics as learned responses or, more specifically, adapted startle reflexes. An injury or traumatic event was thought to evoke a reflex which developed into a tic. The tic persisted because of response chaining, limited awareness, excessive practice, social reinforcement and tolerance of the tic. Azrin and Nunn introduced HR as a multi-component treatment package consisting of tic recording, awareness training, competing response training, motivation enhancement, and generalization training (Azrin and Nunn, 1973). Since their original paper, HR has been applied in different, more or less extended forms. Attempts have been made to identify the active components of the HR package that are necessary and sufficient for tic reduction, indicating that awareness training and competing response training are central to HR effectiveness (Miltenberger et al., 1985; Peterson and Azrin, 1992).

Awareness training consists of tic description, tic detection, an early warning procedure, and situation awareness training. The patient learns to become aware of the presence of the tic. The tic is analysed closely, starting with the premonitory urge preceding the tic (Bliss, 1980; Leckman et al., 1993), and followed by the different muscle groups involved in the tic. Mirrors or camera's can be used to facilitate awareness. In addition, the patient learns to become aware of the situations in which the tic occurs.

With competing response training the patient learns to initiate a response contingent upon the urge to perform a tic or the actual occurrence of the tic. Azrin and Nunn stated that the competing response should be opposite to the tic behaviour, and strengthen the antagonistic muscles that are incompatible with the tic (Azrin and Nunn, 1973). Furthermore, the response should be maintained for several minutes, be socially inconspicuous and easily fit into daily life. Later studies demonstrated that the response does not necessarily need to be isometrically opposite to the tic in order to be effective (Evers and van de Wetering, 1994; Piacentini and Chang, 2001; Sharenow et al., 1989). Evers and van de Wetering (1994) for example, showed that any response that is able to decrease the tension that arises from the premonitory sensation as do the tics, is to be considered an effective response. The competing response should be applied for at least a minute or until the urge to tic fades away (Piacentini et al., 2010; Woods et al., 2008).

The mechanisms underlying HR are currently insufficiently understood. It is stated that the competing response acts as a punitive measure for tic behaviour and that HR enhances self-control and active coping skills (Miltenberger et al., 1985). Moreover, the

effect of HR is attributed to the interruption of stimulus-response associations. By having the patient initiate the competing response at the first symptom signalling the emerging tic, the tic is prevented from manifesting itself, thus facilitating habituation to the sensory experiences (Himle et al., 2007; Hoogduin et al., 1996; Turpin, 1983).

2.2. Evidence

HR is researched in both controlled and uncontrolled studies. Dozens of case studies (1973–2011) showed tic reductions of 30–100% (for a review, Carr and Chong, 2005; Cook and Blacher, 2007). Furthermore, several randomized controlled trials (RCTs) were performed. One of the oldest RCTs compared HR to massed practice in 22 patients, both children and adults (age 11–62 years; mean age 30.5 years) (Azrin et al., 1980). Massed practice consists of repeated, rapid, voluntary performance of tics for a specified period of time, interspersed with brief periods of rest. In one or two 2.5 h sessions, 92% self-reported tic reduction was found for HR as compared to 33% tic reduction for massed practice. In a study of Azrin and Peterson (1990), HR was compared to waiting list in 10 patients aged 6–36 years (mean age 18.1 years). In the HR condition, 93% tic decrease was found compared to no significant decrease in the waiting list condition (Azrin and Peterson, 1990), as measured by home-reported tic counts by a spouse/parent and independent video rating. In this study, between 13 and 30 sessions were performed (mean 20 sessions). O'Connor et al. (2001) also compared HR to waiting list in 47 adults (age 18–60 years; mean age 39.1 years) with either tics or habit disorders like hair pulling. After 12 weekly sessions, 65% of completers reported between 75 and 100% control over the tic/habit, while waiting list showed no significant decrease (O'Connor et al., 2001).

Furthermore, four studies compared HR to supportive psychotherapy. Three studies included adults (Deckersbach et al., 2006; Wilhelm et al., 2003, 2012), and one included children (Piacentini et al., 2010). The two largest studies to date included 126 children (age 9–17; mean age 11.7 years, Piacentini et al., 2010) and 122 adults (age 16–69; mean age 31.6 years, Wilhelm et al., 2012). All studies showed a significant decrease in the HR condition on the Yale Global Tic Severity Scale (YGTSS; Leckman et al., 1989), following 8–14 sessions. The YGTSS is a well-known and reliable instrument to measure tic severity. Effect sizes between 0.57 and 1.50 were reported. Comprehensive behavioural intervention for tics (CBIT) was applied, consisting of habit reversal (i.e., awareness training, competing response training and social support), relaxation training and function-based interventions. In a function-based treatment, individually unique factors that exacerbate or decrease tics are identified and then altered. CBIT, compared with supportive psychotherapy and education, resulted in greater improvement in tic severity.

HR was also compared to cognitive behavioural treatment in one RCT with 14 adults (age 23–49 years, O'Connor et al., 1997). The cognitive behavioural treatment contained HR besides a more general cognitive and behavioural restructuring of the person's approach to high risk situations. In this cognitive restructuring, anticipations and appraisals concerning the appearance of the tics were the central theme. However, no additive effect of these cognitive interventions was found based on a self-reported tic frequency and degree of control. Recently, HR was compared to a combination of HR and mindfulness in 13 children (age 14–18 years; mean age 15.4 years), without finding an additive effect on the YGTSS as well (Franklin et al., 2011). Finally, one RCT compared HR with exposure and response prevention (ER; Verdellen et al., 2004a) in 43 patients aged 7–55 years (mean age 20.6 years). The technique of ER will be explained later in this article. HR was equally effective as ER on three outcome measures: the YGTSS, home tic frequency

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