Chapter 7

TRICHOTILLOMANIA: AN OBSESSIVE-COMPULSIVE SPECTRUM DISORDER?

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In this chapter, we argue that it is a useful heuristic to conceptualize trichotillomania (TTM) as belonging to an obsessive-compulsive spectrum of disorders. Viewing TTM from this perspective provides the researcher with several fertile hypotheses with which to explore the psychobiology of this condition, and it provides the clinician with useful potential strategies for assessment and treatment. At the same time, viewing TTM as *related* to obsessive-compulsive disorder (OCD) does not in any way imply that there are not crucial differences between the symptoms, pathogenesis, and management of the two disorders. Similarly, a view of TTM as an OCD spectrum condition does not exclude the possibility that TTM may be more closely related to a range of other conditions that are characterized by stereotypic or self-injurious behaviors, than it is to OCD.

HISTORICAL PERSPECTIVE

Hair-pulling has long been ascribed to frustration and grief, with depictions of such behavior in the bible, Homer, and Shakespeare (Christenson & Mansueto, 1999). Similarly, Hippocrates advised clinicians to include hair-pulling in their routine mental health examination, and described a patient with hair-pulling in the apparent context of depression. The first detailed case report of pathological hair-pulling, and the coining of the term "trichotillomania," came towards the end of the 19th century (Hallopeau, 1889). Perhaps the first systematic study relevant to hair-pulling was conducted in 1939, and discussed 311 patients (DeBakey & Ochsner, 1939). However, this paper was authored by surgeons primarily interested in the gastro-intestinal sequelae of trichophagia (the eating of one's hair), and gave short shrift to the phenomenology and treatment of hair-pulling.

Much of the subsequent literature was comprised of case reports and small series. A particularly important approach to hair-pulling emerged from the work of Azrin, Nunn, and colleagues (Azrin & Nunn, 1973; Azrin, Nunn, & Frantz, 1980) on a method of "habit reversal" for decreasing a range of unwanted repetitive habits. Their conceptual framework included hair-pulling as one of many habits that patients may suffer from. This spectrum of habits included tics, and is therefore arguably relevant to the current interest in TTM as an obsessive-compulsive spectrum disorder today. Nevertheless, these authors were more interested in stereotypic behaviors per se, than in classical obsessions and compulsions. This work continues to influence current approaches to the cognitive-behavioral treatment of TTM (Keuthen, Aronowitz, Badenoch, & Wilhelm, 1999; Stemberger, Stein, & Mansueto, 2003).

In 1980, TTM was included in the DSM system, but arguably the most important impetus to research on TTM came later that decade, when researchers with interests in OCD raised the question of whether medications that had recently been found useful for the repetitive symptoms of that disorder, could also be effective in TTM. Whereas depression responded to both clomipramine, a serotonin reuptake inhibitor (SRIs), and to desipramine, a noradrenaline reuptake inhibitor, OCD was unusual in that it responded much more robustly to clomipramine than desiprame (Zohar & Insel, 1987). Swedo and colleagues reported that TTM, like OCD, showed a significantly more robust response to clomipramine (Swedo et al., 1989).

This report was seminal in raising the interests of clinicians and of consumer advocates in TTM, in suggesting that TTM (like OCD) was a disorder with particular psychobiological underpinnings, and in proposing a novel line of intervention for its management. Indeed, the finding that TTM responded selectively to clomipramine helped trigger a range of subsequent studies on TTM, a number of which specifically attempted to address the question of its relationship to OCD (Stein, Simeon, Cohen, & Hollander, 1995; Swedo, 1993). It is important to emphasize that Swedo and colleagues were not arguing that TTM was a form of OCD per se; nevertheless, they had developed a perspective which continues to be useful in thinking about new studies of people with TTM and in working with patients who are seeking help for hair-pulling.

SYMPTOMATOLOGY

The symptoms of TTM and OCD are in one way entirely different; OCD may be characterized by a range of obsessions and compulsions, whereas TTM does not typically involve obsessions and the behaviors focus primarily on the activity of hair-pulling. Some authors have suggested that hair-pulling is more reminiscent of comorbid tics in OCD than of compulsions per se. OCD symptoms are often precipitated by exposure to feared stimuli (eg, sources of contamination), whereas TTM is frequently precipitated by particular affective states (eg, boredom) (Christenson, Ristvedt, & Mackenzie, 1993). In our experience, whereas OCD frequently occurs at different times of the day, TTM is often worse at night.

At the same time, there are some important similarities between the symptoms of OCD and TTM. Both compulsions and hair-pulling are repetitive, unwanted, and ritualistic (hair-pulling rituals may include playing with the hair, selecting a hair to pull, the pulling itself, and then mouthing, biting, swallowing, or other disposal of the hair). Both can be preceded by an urge; in OCD obsessions triggers compulsions,

while in TTM there is frequently a preceding somatic sensation (eg, scalp itchiness) or an urge to pull out hair. Symptom dimensions such as time spent, accompanying distress when the behavior is prevented, and lack of control, all of which are reliably anchored by the Yale-Brown Obsessive-Compulsive Scale (Goodman et al., 1989), are useful in assessing the severity of both OCD and TTM.

Both OCD and TTM can involve a concern with symmetry. Some OCD patients wash symmetrically or have multiple ordering and arranging compulsions while some hair-pulling patients carefully pull on both sides of the scalp or carefully ensure that eyebrows or eyelashes are symmetrical. Both conditions are characterized by a sense of shame and embarrassment; the person with OCD worries that people will think him or her crazy because the compulsions are disproportionate to reality and the person with TTM berates himself or herself for the fact that their hair-pulling is self-inflicted. This self-blame not only exacerbates accompanying distress, but contributes to delayed help-seeking (Seedat & Stein, 1998; Soriano et al., 1996).

A number of other clinical features deserve mention in considering the relationship between OCD and TTM. Both disorders have a prevalence of around 2% or more (Christenson & Mansueto, 1999). Prevalence of both conditions in dermatology clinics may be even higher. Infant hair-pulling and toddler or early child compulsions are normal phenomena that subsequently often disappear. Hair-pulling most commonly begins at the time of puberty, with OCD typically beginning either somewhat earlier or later than puberty, but also during or after pregnancy. Hair-pulling is significantly more common in females, but in both early onset OCD and early onset TTM, the relative proportion of males increases. Both disorders are seen in all socio-economic classes and in all ethnic groups (although rigorous and representative community surveys of TTM remain to be done).

Comorbidity with other psychiatric conditions is high in both disorders (Christenson & Mansueto, 1999). In particular, both disorders frequently have comorbid mood, anxiety, eating, and substance use disorders. Lower comorbidity in childhood and adolescent samples of both OCD and TTM suggests the possibility that some of the comorbidity results as a sequel of the primary condition, and might be prevented by earlier, more rigorous intervention. There is also some evidence that certain personality disorders are increased in both disorders, although this question has not been as well studied in TTM and it is difficult to reach firm conclusions at this point in time. Small studies directly comparing comorbid symptoms and disorders across the two disorders have, however, indicated that comorbidity is higher in OCD than in TTM (Himle, Bordnick, & Thyer, 1995; Stanley, Swann, Bowers, Davis, & Taylor, 1992; Tukel, Keser, Karali, Olgun, & Calikusu, 2001).

While many psychiatric disorders are disabling, it is relevant to note that the prevalence, chronicity, comorbidity, and morbidity associated with both OCD and TTM have often been underestimated. There is growing evidence that the costs of OCD, particularly in terms of functional impairment and associated disability, are amongst the highest of those associated with any general medical disorder (Mogotsi, Kaminer, & Stein, 2000). TTM, while perhaps not as disabling as OCD, can be associated with surprisingly high levels of distress and impairment (Seedat & Stein 1998; Soriano & Stein, 1996) and trichophagy may have fatal consequences (Bouwer & Stein, 1998). These findings highlight the need for increased community outreach programs to ensure earlier diagnosis and treatment of both disorders.

PSYCHOBIOLOGY

The psychobiology of OCD has been more frequently and rigorously investigated than that of TTM, so that drawing definitive conclusions about the relevant similarities and differences between these two conditions ultimately requires much more additional study. Nevertheless, based on the limited set of studies to date, a number of preliminary comments can be made about the neuroanatomy, neurochemistry, neuroimmunology, and neurogenetics of OCD and TTM. In our view, these studies provide some support for the argument that there is a relationship between OCD and TTM, although the two disorders are distinct in many respects, and TTM may ultimately be best conceptualized as lying on a spectrum of stereotypic or self-injurious conditions.

There is growing evidence of the importance of corticostriatal-thalamic circuits in OCD (Rauch & Baxter, 1998). A range of different data point to this, but perhaps the most persuasive is from structural and functional brain imaging. There is increased activity in corticostriatal-thalamic circuits prior to treatment and a number of studies have found changes in caudate volume in OCD subjects. In TTM, there is evidence of decreased volume in the left putamen (O'Sullivan et al., 1997) but not in the caudate (O'Sullivan et al., 1997; Stein, Coetzer, Lee, Davids, & Bouwer, 1997); and this is consistent with the more motoric nature of hair-pulling symptoms. During treatment with either SRIs or cognitive-behavioral therapy (CBT), there is normalization of neuronal activity in OCD. Similarly, during SRI treatment of TTM, there is normalization of perfusion in frontal circuits (Stein et al., 2002). Furthermore, although baseline functional imaging seems to differ in OCD and TTM, decreased frontal activity may predict response to SRIs in both disorders (Stein et al., 2002; Swedo, Rapoport, Leonard, & et al., 1991).

Brain imaging studies are consistent with much earlier work demonstrating that OCD can be associated with a range of neurological insults to the basal ganglia (Cheyette & Cummings, 1995; Cummings & Cunningham, 1992), and that conversely, patients with OCD demonstrate specific neuropsychiatric and neuropsychological impairments. There is much smaller literature on neurological lesions resulting in hair-pulling symptoms, on neurological soft signs in TTM, and on neuropsychological impairment in these patients, therefore, conclusions cannot be drawn with certainty at this stage. Nevertheless, the work on TTM does provide some evidence (including data on visual-spatial impairment in TTM) to support the hypothesis that as in the case of OCD, corticostriatal-thalamic circuits do play a role in underpinning TTM symptoms (Stein, O'Sullivan, & Hollander, 1999).

Corticostriatal-thalamic circuitry incorporates a range of different neurotransmitter systems including the serotonin and dopamine systems. The selective response to serotonergic agents has led to a great deal of work on the role of the serotonin system in OCD. Although there is little definitive evidence that serotonergic dysfunction underlies OCD, it is clear that the serotonin system plays a key role in mediating symptoms. During effective treatment with SRIs, for example, there is a decrease in cerebrospinal fluid levels of 5-hydroxyindoleacetic acid, a primary metabolite of serotonin (Thoren, Asberg, & Bertilsson, 1980). This is reminiscent of the finding that high cerebrospinal fluid 5-hydroxyindoleacetic acid predicts response to SSRIs in TTM (Ninan, Rothbaum, Stipetic, & et al., 1992). There is some evidence that administration of the

serotonin agonist metachlorophenylpiperazine results in symptom exacerbation in a proportion of OCD patients, but in a "high" feeling in TTM, suggesting overlapping but differential involvement of the serotonin system in both disorders (Stein et al., 1995).

Dopamine also plays a role in mediating OCD. Dopaminergic agonists can exacerbate compulsions, and dopamine blockers are used to augment SSRIs in the treatment of OCD (Goodman, McDougle, & Lawrence, 1990). The dopaminergic system is strongly implicated in Tourette's disorder (TS), and in OCD patients with tics there is evidence of worse response to SSRIs, but responsivity to the combination of a dopamine blocker and an SSRI (Hawkridge, Stein, & Bouwer, 1996; McDougle, Goodman, & Leckman, 1994). Similarly, in TTM, there is exacerbation of hair-pulling by dopamine agonists, and dopamine blockers can be useful in augmenting the treatment response to SSRIs (Stein et al., 1997). Although hair-pulling is a common comorbid symptom in TS, tics are less common in TTM than in OCD (Lochner et al., unpublished data). On the other hand, when prescribed without SSRIs, dopamine blockers do not appear effective for OCD, but may be useful in TTM (Stewart & Nejtek, 2003).

A broad range of neurochemical systems other than serotonin and dopamine may mediate both OCD and TTM. The role of steroidal hormones is suggested by data such as the frequent onset of OCD during or after pregnancy, and the common exacerbation of both OCD and TTM symptoms during menstruation. The opioid system has also been implicated in both conditions. Both disorders also deserve more study with regard to a range of different neuropeptides that may play a role in mediating stereotypic behavior (Leckman, Goodman, & North, 1994). Ultimately, it will be necessary to characterize the second and third messenger pathways involved in the mediation of these and other OCD spectrum conditions.

An ultimate goal of research in this area is to determine the precise genetic and environmental factors that cause disruption in CTSC circuits. There is good evidence from family studies for the heritability of OCD, but the heritability of TTM remains unclear. Nevertheless, there is also some evidence for increased prevalence of OCD in the families of TTM probands. Ultimately, the specific genetic variants that may contribute to OCD and TTM need to be determined. A recent report noting that a homeobox gene is required for the mediation of grooming behavior in rodents certainly encourages such work to proceed (Greer & Capecchi, 2002). Genetic factors may also play a role in the susceptibility of certain species of animal to develop grooming problems, including hair-pulling and feather-picking (Hugo et al., 2003).

Autoimmunity has recently been hypothesized to contribute to CTSC damage in OCD and spectrum disorders. This idea is based on the observation that OCD symptoms and tics may develop after Streptococcal infection (Leonard & Swedo, 2001). Such patients may have elevated expression of a marker of susceptibility to rheumatic fever, the B lymphocyte antigen D8/17. To date there is no evidence that D8/17 is higher in OCD than in TTM and healthy controls (Niehaus et al., 1999). However, there is some evidence that hair-pulling may relapse after streptococcal infection, and an interesting case report documented the onset of hair-pulling in the context of Sydenham's chorea. The question of whether particular genetic variables contribute to vulnerability for such auto-immune processes, the extent to which D8/17

is a valid marker, and the proportion of OCD or TTM cases in which auto-immunity plays a role, remains to be clarified.

Although recent literature has focused on neuropsychiatric factors in OCD, a possible role for psychological factors in precipitating or exacerbating symptoms should not be ignored. Psychodynamic theories emphasizing the role of such factors have not, however, received a great deal of empirical attention. Data from our group found that scores on a childhood trauma scale were increased in OCD and TTM compared with normal controls, and this issue therefore requires further study (Lochner et al., 2002). There is growing recognition that adverse childhood environments may be associated with specific neurobiological sequelae, and it is possible that these in turn are associated with vulnerability to the development of stereotypic symptoms (Martin, Spicer, Lewis, Gluck, & Cork, 1991).

TREATMENT

OCD responds in 40–60% of cases to treatment with an SSRI. In TTM, open-label studies of SSRIs were promising, but controlled studies have yielded negative results (O'Sullivan, Christenson, & Stein, 1999). Nevertheless, it is possible that a subgroup of patients with TTM does respond to treatment with these agents, and they continue to be used in clinical practice. Although the early report by Swedo and colleagues has not been replicated, it is possible that clomipramine is particularly useful in TTM. Interestingly, there is also some evidence from metaanalyses of the OCD clinical trials database that clomipramine is also particularly effective in that disorder (Stein, Spadaccini, & Hollander, 1995). While the superior efficacy of clomipramine in OCD and TTM is far from proven, it is interesting to speculate that the relatively non-specific actions of this agent (including dopaminergic effects) may contribute to its efficacy.

Treatment efficacy is typically maintained over time in OCD. Nevertheless, there are some patients in whom response to SSRI "poops out." Again, in TTM, the data are more inconsistent; although there are some data that response is maintained, there is also an impression that early response to SSRI is often lost over time (O'Sullivan et al., 1999). Should future prospective studies confirm that the duration of response to pharmacotherapy differs in OCD and TTM, this would again provide an interesting departure point for considering the exact range of overlapping and distinguishing features that characterizes the neurobiological intersection between these conditions. Some authors have argued that loss of response to SSRIs over time is seen in those disorders that lie on the more impulsive pole of the putative compulsive-impulsive OCD spectrum of conditions.

Augmentation with antipsychotic medication is useful in ~50% of OCD cases (McDougle, Epperson, Pelton, & et al., 2000). There is some evidence from case studies and series that a similar strategy may also work in TTM, although further work is needed (O'Sullivan et al., 1999). It is possible that whereas refractory OCD patients, or OCD patients with tics, respond to a combination of serotonergic and dopaminergic agents, in TTM there is a response to dopaminergic drugs alone (Stewart & Nejtek, 2003). Such data once again underscore the central contention of this chapter; that although OCD and TTM are clearly not the same phenomenon, work on one disorder may be useful in informing clinical practice and research studies on the other.

What about psychotherapy? The best studied intervention for OCD is exposure and response prevention, although cognitive techniques may also be effective. In TTM, the principles of cognitive-behavioral therapy are rather different, with the emphasis instead on habit reversal as well as a range of associated techniques (Keuthen et al., 1999; Stemberger et al., 2003). These differences reflect the possibility that in many cases of OCD, negative reinforcement is important; whereas in many (but not all) cases of TTM, positive reinforcement is key. At the same time, there is also some overlap in the cognitive-behavioral therapy techniques used to treat these conditions; self-monitoring, for example, may play an especially important role in the cognitive-behavioral therapy of both OCD and TTM. Whereas pharmacotherapy and psychotherapy for OCD may be similarly effective, in TTM there is some evidence for the relative superiority of behavioral therapy (Minnen, Hoogduin, Keijsers, Hellenbrand, & Hendriks, 2003).

CONCLUSION

Clearly, OCD and TTM are two entirely different disorders. Nevertheless, they are characterized by a range of overlapping phenomenological and psychobiological features, and approaches to the assessment and treatment of the two conditions can usefully inform one another. At the same time, however, the extent of overlap between OCD and TTM may, in the larger scheme of things, be relatively small. In our experience, TTM patients feel uncomfortable participating in OCD self-help groups, and vice versa, highlighting the differences in phenomenology between these two conditions. There are also crucial differences in pharmacotherapeutic and psychotherapeutic approaches to OCD and TTM. It is also important to emphasize the heterogeneity of both disorders; this chapter has not addressed in detail the possibility that certain subgroups of OCD and TTM (du Toit, van Kradenburg, Niehaus, & Stein, 2001) have a particularly close relationship.

Trichotillomania may be related more closely to other disorders characterized by stereotypic and self-injurious behaviors than to OCD. In particular, there is phenomenological overlap between TTM, skin-picking, and stereotypic movement disorder in adults of normal intelligence (Lochner, Simeon, Niehaus, & Stein, 2002). Significantly, the prevalence of stereotypic behaviors other than hair-pulling in TTM is high. There are also important neurobiological and treatment overlaps across these conditions (Stein & Simeon, 1998), although much remains to characterize them further. It is also worth considering the phenonomenology and psychobiology overlaps and contrasts between TTM, impulsive symptoms, and the other impulse control disorders (eg, pathological gambling) (Stein et al., 1995).

In our view, it is useful to consider TTM and related stereotypic disorders, as forming one pole of an OCD spectrum of disorders. This provides a heuristic framework for both research studies and clinical intervention. Indeed, this framework has already provided the impetus for a range of studies on the neurobiology and pharmacotherapy of TTM. Without this framework, data such as those on decreased putamen volume in TTM would likely not have been sought or found. Similarly, investigators may well have been slower to explore the role of antipsychotic agents in the treatment of TTM. In the future, when more is known about the neurobiology of both OCD and the stereotypic disorders (such as skin-picking), this heuristic may,

however, no longer be useful and may well need to be replaced with a different framework.

Is it time to consider removing OCD from the anxiety disorders, and including it together with TTM, TS and a number of other conditions in an obsessive-compulsive spectrum section of DSM? Clearly, the current DSM classification reflects historical contingencies, and many have argued that OCD is not an anxiety disorder (Montgomery, 1993). Although the architects of DSM-IV did make changes to DSM-III-R on the basis of new evidence, the kind of evidence needed for moving disorders from one section to another was not specified particularly rigorously, and it is therefore difficult to provide an unequivocal answer to this question.

Nevertheless, a section on OCD spectrum disorders would remind clinicians of the phenomenological and psychobiological overlaps between, say, OCD and TS. It would remind clinicians to assess TTM in OCD and TS, to assess skin-picking and OCD in body dysmorphic disorder, and so on. In our experience, many TTM patients appreciate learning about the concept of an OCD spectrum, this helps destigmatize their symptoms, and helps them combat self-blame. Finally, the spectrum concept helps clinicians to think about management approaches. Despite the lacklustre performance of SSRIs in TTM, they are still useful treatment option for some patients. Dopamine blockers are an important option in OCD, TTM, and a number of spectrum disorders. Cognitive-behavioral therapy is crucial in both OCD and TTM, and many OCD therapists are also skilled in the treatment of TTM. Thus, combining TTM and OCD in a single section in future classification schemes has some appeal.

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