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## The Clinical Characteristics, Neurobiology, and Treatment Options for Trichotillomania

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### ABSTRACT

Trichotillomania is characterized by the compulsive act of pulling one's own hair, leading to hair loss and potentially causing functional impairment. Trichotillomania, a psychiatric disorder characterized by the compulsive need to pull out one's own hair, has been documented in the medical literature since the 19th century. Based on prevalence surveys, trichotillomania exhibits a notable presence throughout the population, with point prevalence estimates ranging from 0.5 to 2.0 percent. Trichotillomania, as delineated in the Diagnostic and Statistical Manual of Mental Disorders-5, is categorized as an obsessive-compulsive disorder (OCD); nonetheless, it exhibits notable distinctions from OCD across various dimensions. For instance, the use of habit reversal therapy and the administration of drugs like n-acetylcysteine or olanzapine are common ways to treat trichotillomania. It is important to note that these treatment approaches are not typically employed for the treatment of obsessive-compulsive disorder (OCD). In contrast, it appears that specific first-line medications for obsessive-compulsive disorder (such as selective serotonin reuptake inhibitors) do not demonstrate efficacy in treating trichotillomania. This article provides an overview of the existing body of knowledge pertaining to trichotillomania, a psychiatric disorder characterized by compulsive hair pulling. It also examines the available empirical evidence that supports various treatment approaches for this condition.

### 1. Introduction

The repetitive act of pulling out one's own hair is frequently a symptom of trichotillomania, also known as hair-pulling disorder. This behavior leads to hair loss and substantial impairment in daily functioning. Trichotillomania, a condition characterized by the compulsive urge to pull out one's own hair, has been the subject of scholarly discourse for more than a century. However, it was not formally recognized as a mental health disorder in the diagnostic and statistical manual of mental disorders (DSM) published by the American Psychiatric Association until the DSM-III-R edition in 1987. At that time, trichotillomania was classified as an impulse control disorder that did not fit into any other existing category. Trichotillomania

was incorporated into the section dedicated to obsessive-compulsive and related disorders in the fifth edition of the Diagnostic and statistical manual of mental disorders (DSM-5). This classification encompasses other conditions, including body dysmorphic disorder, excoriation disorder, and hoarding disorder. The subsequent criteria represent the prevailing diagnostic guidelines for trichotillomania: Trichotillomania is characterized by the act of pulling one's own hair, resulting in hair loss, significant distress or impairment, attempts to cease or minimize hair pulling behavior, and the absence of any other identifiable medical or psychiatric condition that could account for the hair pulling behavior.<sup>1-3</sup> This article provides an overview of the existing body

of knowledge pertaining to trichotillomania, a psychiatric disorder characterized by compulsive hair pulling.

### **Epidemiology and clinical characteristics**

Although there is a limited availability of nationwide epidemiological studies on trichotillomania, smaller studies conducted primarily in university settings have provided insights into the prevalence of this condition. These studies have indicated a lifetime incidence of roughly 0.6 percent and a point prevalence ranging from 0.0 percent to 3.9 percent. The data presented may underestimate the true population prevalence of trichotillomania due to the tendency of individuals afflicted with this condition to experience humiliation and embarrassment. Trichotillomania exhibits a notable gender disparity in adults, with a substantial prevalence among females (4:1; female:male). This ratio is unparalleled when compared to other mental disorders. Research has demonstrated that there is an equal distribution of sexes during infancy.<sup>4,5</sup>

Trichotillomania, the act of pulling one's hair, exhibits a high prevalence and is commonly observed over a spectrum that encompasses varying degrees of severity. The regions of the scalp, brows, and eyelashes are frequently subjected to tugging; however, it is worth noting that pulling from other areas of the body is also prevalent. The occurrence of multiple site pulls is quite infrequent, and the duration of these episodes might vary from a few minutes to many hours.

The act of hair pulling typically commences during the later stages of childhood or the early phases of adolescence. Trichotillomania is frequently associated with diminished self-esteem, reduced quality of life, and a propensity to avoid social situations due to its onset during a developmental phase. This avoidance may manifest in various ways, such as reluctance to engage in activities like haircuts, swimming, outdoor exposure on windy days, participation in sports, or pursuing romantic relationships. Stress, boredom, or periods of inactivity may all function as stimuli to

engage in the act of pulling. Moreover, a considerable number of people exhibit a lack of awareness of their compulsive pulling behaviors, commonly known as "automatic" pulling, which represents a persistent manifestation of the disorder. A notable proportion, ranging from 10% to 20%, of patients diagnosed with trichotillomania engage in the consumption of their own hair subsequent to the act of pulling it out, a behavior commonly referred to as "trichophagia." This particular habit has been associated with potential adverse consequences such as the obstruction of the gastrointestinal tract and the formation of masses of hair in the intestines, known as "trichobezoars," which may necessitate surgical intervention.<sup>3-6</sup>

### **Neurobiology of trichotillomania**

While there is little research available regarding the pathophysiology of trichotillomania, there is evidence suggesting the presence of a familial component. Multiple studies on families have demonstrated a higher occurrence of trichotillomania, as well as mood and anxiety disorders, among the immediate relatives of those affected by trichotillomania. A recent study conducted research that revealed a positive correlation between the presence of trichotillomania in probands and elevated perceptions of hair pulling recurrence risk among their relatives.<sup>7</sup>

Animal models offer several benefits when investigating the pathophysiology of trichotillomania, particularly when utilizing models that closely resemble the disorder's behavioral and clinical manifestations. There are three animal species that exhibit a notable increase in grooming behavior: the HoxB8 knockout mouse, the SAPAP3 knockout mouse, and the SliTrk5 knockout mouse. The potential relevance of SAPAP3, specifically in relation to trichotillomania, is reinforced by the identification of rare variations in the SAPAP3 gene that are associated with human disorders, including hair pulling. Typically, the HoxB8 gene exhibits expression in the orbitofrontal cortex and striatum of mice, regions that are likewise prominently implicated in the pathophysiology of obsessive-compulsive disorder

(OCD) in humans.<sup>8,9</sup>

Several limited neuroimaging studies have been undertaken to examine potential structural brain abnormalities in trichotillomania, with the majority of this research employing "region-of-interest" methodologies. In a recent multi-site worldwide study examining cortical thickness and subcortical volume, a group of 76 patients diagnosed with trichotillomania was compared to a control group consisting of 41 individuals. The findings of this study revealed that trichotillomania patients exhibited aberrant cortical thickness, namely in a cluster that was most pronounced in the right inferior frontal gyrus. The aforementioned abnormalities seem to have a significant impact on the pathophysiology of trichotillomania and are believed to be an inherent characteristic. The findings presented do not align with the characteristics typically associated with obsessive-compulsive disorder (OCD).<sup>10,11</sup>

A new study that was done in several places wanted to learn more about subcortical morphometric abnormalities in people with trichotillomania, focusing on changes in curvature that happen in specific areas. There were 68 people with trichotillomania in the study group, along with 41 healthy controls who were not diagnosed with the disorder. The results showed that the volume of the right amygdala and left putamen was significantly smaller in the trichotillomania group. The bilateral nucleus accumbens, bilateral amygdala, right caudate, and right putamen all had shape problems that were limited to one area. The presence of subcortical structural abnormalities appears to have a significant role in affect regulation, inhibitory control, and habit formation. In addition to previous research on the biological aspects of trichotillomania, a recent study examined hormone indicators among adolescent females diagnosed with trichotillomania. Trichotillomania typically manifests throughout adolescence and exhibits a higher prevalence among girls. A recent study conducted on a cohort of eleven adolescent females diagnosed with trichotillomania has shed light on the impact of sex hormones. The

findings revealed a significant correlation between reduced progesterone levels and the severity of symptoms experienced by the participants. Furthermore, the study also observed that diminished levels of all hormones were connected with worse overall functioning among the affected individuals.<sup>8-11</sup>

## **Treatment**

### **Psychotherapy**

Cognitive behavioral therapy encompasses a range of therapeutic techniques that are widely recognized and proven to be useful in the treatment of trichotillomania. One example of an established treatment approach for trichotillomania is habit reversal therapy (HRT), which has demonstrated a significant impact size when compared to control conditions. HRT is commonly employed as the initial therapeutic approach, prioritizing the following components: enhancing awareness through training to recognize situations that may precede episodes of hair pulling; employing relaxation techniques to address anxiety and stress, which are often identified as triggers for hair pulling episodes; implementing competing response training to substitute undesired pulling behaviors with alternative, less conspicuous actions; utilizing motivation procedures to foster engagement and commitment to the treatment process; and incorporating generalization training to promote the application of learned skills beyond the therapy setting. In the management of trichotillomania, a combination of dialectical behavior therapy techniques and traditional cognitive behavioral procedures has been employed. The treatment protocol encompasses mindfulness training, wherein patients are instructed to consciously experience impulses or unpleasant emotions in the present moment and acquire the ability to allow them to dissipate without engaging in the act of pulling. Additionally, patients are educated on techniques for effectively managing negative emotions without resorting to pulling, as well as cultivating the capacity to endure urges or stressful events without engaging in the behavior of pulling.<sup>9,10</sup>

Acceptance and commitment therapy (ACT) is a form of psychotherapy that involves encouraging patients to experience their urges to engage in impulsive behaviors while simultaneously promoting the acceptance of these urges without engaging in corresponding actions. Negative emotions linked to tugging are also elicited but remain unarticulated. The concept posits that through the process of understanding, perceiving, and encountering, individuals can recognize that they are not compelled to respond to their desires or emotions. This realization may enable the patient to develop a sense of agency over their impulses. Preliminary research suggests that the application of exposure treatment, a therapeutic approach derived from the domain of obsessive-compulsive disorder (OCD), may potentially be beneficial in addressing trichotillomania. The treatment protocol comprises a concise, four-element approach grounded in the underlying principle that hair-pulling behavior is perpetuated through negative reinforcement, akin to the compulsions observed in individuals with obsessive-compulsive disorder (OCD). The initial component of the intervention involves the analysis of the individual's pattern of hair-pulling behavior. Subsequently, the second component entails the development of a hierarchical structure to address hair-pulling tendencies. The third component incorporates exposure techniques that are tailored to the individual's specific hierarchy. Finally, the fourth component focuses on the treatment of emotion dysregulation.<sup>11-13</sup>

### **Pharmacotherapy**

No regulatory agency has authorized any medications for the treatment of trichotillomania. With that being stated, numerous studies have been conducted to ascertain the safety and efficacy of diverse medicinal interventions. N-acetylcysteine (NAC), clomipramine, olanzapine, and dronabinol are pharmacotherapies that have demonstrated efficacy in the treatment of trichotillomania. However, it is important to note that the effectiveness of these drugs has been established based on limited sample sizes in

clinical trials. The results obtained for the treatment of trichotillomania were found to be inconsistent.<sup>14</sup>

The research conducted on adults showed greater efficacy compared to the placebo; however, the studies conducted on children did not yield similar results. The results underscore the potential for variations in the disease across different age cohorts and potential evolutionary changes through time. The adverse effects of N-acetylcysteine (NAC) are often mild in nature, primarily manifesting as symptoms of bloating and flatulence. In 12-week, double-blind, placebo-controlled research, the efficacy of Lanzapine, an antipsychotic medicine, was evaluated using a limited sample size of 23 participants. In the study, it was observed that olanzapine, administered at an average daily dosage of 10.8 mg, exhibited significant efficacy in reducing symptoms of trichotillomania compared to a placebo. However, it is important to note that olanzapine has been associated with the development of metabolic syndrome. Consequently, the potential adverse effects related to metabolic syndrome should be taken into account when considering the prescription of this medication. In conclusion, serotonin reuptake inhibitors are frequently prescribed for the treatment of trichotillomania. However, comprehensive analyses of several studies have indicated that only clomipramine demonstrates some efficacy in alleviating symptoms, albeit to a limited extent.<sup>15</sup>

The management of hair-pulling behavior appears to hold significance in promoting long-term well-being and enhancing one's overall quality of life. Based on the findings of the study, it appears that a dosage of 1200 mg of N-acetylcysteine (NAC) administered twice daily is the most feasible option with minimal occurrence of significant adverse effects. Furthermore, the administration of dopamine blockers such as olanzapine may provide potential benefits; nonetheless, it is imperative to closely monitor and manage their associated adverse effects.<sup>14,15</sup>

## 2. Conclusion

Trichotillomania is a persistent disorder that, when not addressed, frequently results in notable psychological impairment and, in exceptional cases, potentially fatal medical complications. In order to optimize treatment modalities, it is imperative to have a more comprehensive understanding of the neurology underlying trichotillomania.

## 3. References

1. Grant JE. Trichotillomania (hair pulling disorder). *Indian J Psychiatry*. 2019; 61: S136-9.
2. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed. Washington, DC: American Psychiatric Association. 2013.
3. Odlaug BL, Grant JE. Impulse-control disorders in a college sample: results from the self-administered Minnesota impulse disorders interview (MIDI). *Prim Care Companion J Clin Psychiatry*. 2010; 12.
4. Grant JE, Chamberlain SR. Trichotillomania. *Am J Psychiatry*. 2016; 173: 868-74.
5. Tung ES, Flessner CA, Grant JE, Keuthen NJ. Predictors of life disability in trichotillomania. *Compr Psychiatry*. 2015; 56: 239-44.
6. Grant JE, Redden SA, Leppink EW, Odlaug BL, Chamberlain SR. Psychosocial dysfunction associated with skin picking disorder and trichotillomania. *Psychiatry Res*. 2016; 239: 68-71.
7. Keuthen NJ, Altenburger EM, Pauls D. A family study of trichotillomania and chronic hair pulling. *Am J Med Genet B Neuropsychiatr Genet*. 2014; 165B: 167-74.
8. Fouche JP, du Plessis S, Hattingh C, Roos A, Lochner C, Soriano-Mas C, et al. Cortical thickness in obsessive-compulsive disorder: multisite mega-analysis of 780 brain scans from six centres. *Br J Psychiatry*. 2017; 210: 67-74.
9. Chamberlain SR, Harries M, Redden SA, Keuthen NJ, Stein DJ, Lochner C, et al. Cortical thickness abnormalities in trichotillomania: International multi-site analysis. *Brain Imaging Behav*. 2018; 12: 823-8.
10. Isobe M, Redden SA, Keuthen NJ, Stein DJ, Lochner C, Grant JE, et al. Striatal abnormalities in trichotillomania: a multi-site MRI analysis. *Neuroimage Clin*. 2018; 17: 893-8.
11. Grant JE, Chamberlain SR. Salivary sex hormones in adolescent females with trichotillomania. *Psychiatry Res*. 2018; 265: 221-3.
12. Lee EB, Homan KJ, Morrison KL, Ong CW, Levin ME, Twohig MP, et al. Acceptance and commitment therapy for trichotillomania: a randomized controlled trial of adults and adolescents. *Behav Modif*. 2018: 145445518794366.
13. Rothbart R, Amos T, Siegfried N, Ipser JC, Fineberg N, Chamberlain SR, et al. Pharmacotherapy for trichotillomania. *Cochrane Database Syst Rev*. 2013; (11): CD007662.
14. Bloch MH, Panza KE, Grant JE, Pittenger C, Leckman JF. N-acetylcysteine in the treatment of pediatric trichotillomania: a randomized, double-blind, placebo-controlled add-on trial. *J Am Acad Child Adolesc Psychiatry*. 2013; 52: 231-40.
15. McGuire JF, Ung D, Selles RR, Rahman O, Lewin AB, Murphy TK, et al. Treating trichotillomania: a meta-analysis of treatment effects and moderators for behavior therapy and serotonin reuptake inhibitors. *J Psychiatr Res*. 2014; 58: 76-83.