

REVIEW

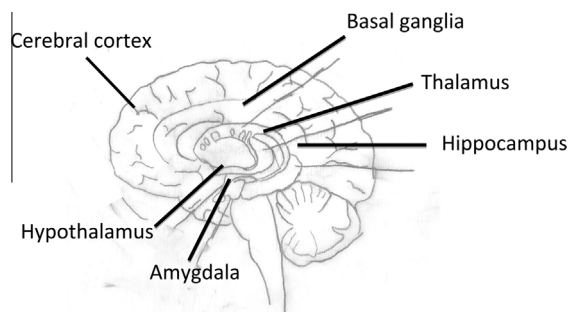
Review of available studies of the neurobiology and pharmacotherapeutic management of trichotillomania



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GRAPHICAL ABSTRACT



Brain regions implicated in the pathology of trichotillomania (TTM)

ARTICLE INFO

Article history:

Received 12 January 2015

Received in revised form 5 May 2015

Accepted 20 May 2015

Available online 10 June 2015

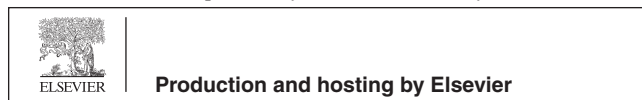
ABSTRACT

Trichotillomania (TTM) is a psychiatric disorder characterized by an irresistible urge to pull out one's hair. Currently there are no FDA approved treatments for TTM, which makes it difficult for clinicians to select an appropriate therapeutic plan. The clinical studies that have been performed do not provide sufficient or consistent evidence regarding which drug classes should be administered. Unfortunately, most of the available data consist of case reports and clinical trials with limited sample size. This review provides an overview of currently available clinical

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Peer review under responsibility of Cairo University.



Keywords:

Trichotillomania (TTM)
Neurobiology
Rating scales
Clinical trials

literature that targets TTM. A summary of clinical trials as well as case reports is provided. The most common rating scales used for clinical assessment are also reviewed. The etiology of TTM remains unclear. Studies that examine various neuroanatomical, neurobiologic, as well as genetic factors associated with TTM are thoroughly discussed in this review. It is evident that clear understanding of TTM is crucial to provide better recognition, assessment, and treatment to patients of this disorder. Finally, despite research efforts for establishing pharmacological options for treatment, it is clear that new targets are warranted in order to ensure a clinically supported effective pharmacological approach to treat TTM.

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Jacklyn Johnson is a pharmacist. She got her Pharm D from Chicago State University in May 2015. Her research interests focus on neuropsychiatric disorders, particularly trichotillomania and the development of new medications for its management.



Abir T. El-Alfy is an Associate Professor of Pharmaceutical Sciences and is a graduate of the Faculty of Pharmacy, Cairo University, Egypt. She has a Master Degree in Microbiology, and a Ph.D. in Pharmacology and Toxicology from the University of Mississippi. She was an Assistant Professor at King Saud University; an Assistant Professor, as well as the Director of the Behavioral Neuroscience Core-NPN at the School of Pharmacy, University of Mississippi. She has

published numerous research papers in peer reviewed journals. She holds two patents; one on developing indole compounds as antidepressant medications, and another on the anxiolytic actions of pterostilbene.

Introduction

Originally described by Hallopeau in 1889, trichotillomania (TTM) is a psychiatric disorder that is characterized by the uncontrollable urge to pull out one's hair [1]. The preferred term for this condition is "hair pulling disorder", as the word "trichotillomania" may be perceived with a negative connotation [2]. It is currently classified under "Obsessive Compulsive and Related Disorders" in the *Diagnostic and Statistical Manual of Mental Disorders, DSM-V* [3]. Diagnostic criteria include the following: continuously pulling out one's own hair, which results in hair loss, multiple attempts to reduce or stop the hair pulling, clinically significant impairment in daily functioning (e.g. social gatherings, work), the hair pulling is not associated with another medical condition, and it cannot be explained by another mental disorder [3]. Previously in DSM-IV, TTM was classified under impulse control disorders (not classified elsewhere). Diagnostic criteria included an increasing sense of tension right before pulling out the hair or when resisting the urge, and pleasure, gratification, or relief

when pulling out the hair [2]. As seen, this criterion was left out of DSM-V as not all TTM sufferers experience these occurrences. Christenson et al. [1] described TTM sufferers as either being aware or unaware of the hair pulling, or a combination of both. These observations led to the TTM subtypes/styles known as focused and automatic, respectively. Automatic hair pulling usually occurs during sedentary activities such as lying in bed, watching TV, or reading. Focused hair pulling, on the other hand, occurs when hair is intentionally pulled out possibly by searching for specific hairs to pull out. This more focused pulling may allow the individual to distract themselves from unwelcomed thoughts or feelings [4]. TTM has a lifetime prevalence of 0.6% (according to DSM-III-R) for both genders. However, Christenson et al. [1] concluded that for females the prevalence may be as high as 3.4% and 1.5% for males. Sufferers typically pull from the scalp, eyebrows, and eyelashes but may also pull from the face, axillary, and pubic regions [1,5]. Some individuals participate in hair-related rituals or behaviors once the hair is pulled out. These could include rolling the hair between finger, running the hair over the lips or through the teeth, biting the hair, and/or swallowing the hair (trichophagia). Others reported pulling out specific hairs based on characteristics such as texture, color, and length [5]. The average age of onset occurs around 13 years, which coincides with puberty [6].

TTM has also been thought to relate to, or overlap with other psychiatric disorders including obsessive compulsive disorder (OCD), Tourette's, and other impulsive disorders such as nail biting and skin picking [1,2,7]. This overlap is seen in TTM's symptomatology including similar ritualistic behavior and trigger cues as seen in body-focused repetitive behavioral disorders (BFRBD) [2]. The similarities observed between TTM and OCD include behaviors in response to urges, anxiety relief after performing the behavior, and the repetitive nature of the disorder [2]. Similarities with OCD also extend into the treatment modalities used. According to Christenson et al. [8] the lifetime prevalence of comorbid psychiatric disorders in TTM patients was found to be as high as 81%, with depression and anxiety subsequently reported as main contributing comorbid disorders to TTM. TTM is a poorly understood disorder. Behavioral therapy has proven effective in many TTM patients; however, the use of pharmacotherapy might be necessitated in some patients. Some individuals with TTM may respond to pharmacotherapy with selective serotonin reuptake inhibitors (SSRIs), as do those with OCD [2].

Limited knowledge exists regarding the neurobiological basis of TTM. However, it is speculated that the disorder probably involves multiple pathways and a complex interaction between genetic, psychological, and social factors.

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