

Trichotillomania Induced by Stimulant Therapy for ADHD: A Rare Case Report

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ABSTRACT

Attention Deficit Hyperactivity Disorder (ADHD) is a common neurodevelopmental disorder in the pediatric population, affecting approximately 5% of children globally. While stimulant medications such as methylphenidate and amphetamine are considered first-line treatments due to their efficacy, they are associated with a range of adverse effects, including appetite suppression, insomnia, and, more rarely, trichotillomania—a body-focused repetitive behavior characterized by compulsive hair pulling. Trichotillomania, although uncommon, can cause significant distress and impairment in daily functioning, particularly in young children.

The association between stimulant use and trichotillomania has been reported in a few other articles across the world, which usually resolves after discontinuation of the stimulant medication. However, further documentation is required due to the limited number of cases and publications limited to only case reports. To support this clinical finding, we report a case of a 9-year-old female who presented with features of trichotillomania following treatment with Dextroamphetamine-amphetamine for ADHD.

Keywords: Distal fibula; Proximal Tibia; Synostosis.

INTRODUCTION

In the pediatric population, the prevalence of ADHD, a neurodevelopmental condition, is reported to be 5% worldwide, where children present with the symptoms of inattention, hyperactivity and impulsivity which can cause significant distress and difficulty in daily functioning. Currently, various treatment options ranging from pharmacotherapy and parental practices to psychotherapy are available, but the efficacy of pharmacotherapy is the most significant.¹ The approved treatment for ADHD includes two main classes of drugs: stimulants (Methylphenidate, Amphetamine) and non-stimulants (Atomoxetine, Guanfacine, Clonidine and Viloxazine), among which stimulants are first-line therapy, and non-stimulants are prescribed if the first line therapy is ineffective, contraindicated or cannot be tolerated. However, stimulant medications have their share of adverse effects among which appetite and growth suppression, insomnia, increased HR & BP, stomach aches and headaches are commonly associated.²

But trichotillomania is also a side effect reported in a few cases worldwide that needs further research.³ The DSM-5 describes trichotillomania as a condition under obsessive-compulsive or body-focused repetitive behaviors where individuals have noticeable non-patchy hair loss (alopecia) due to an irresistible urge for hair pulling and recurrent hair pulling. The patients have reduced stress or feelings of relief following hair pulling, which creates significant discomfort and impairment in daily functioning.⁴ It is estimated that the documented prevalence of this condition is 0.5-2% in the general population⁵, while in the pediatric population, it primarily affects the female population ranging from 9-13 years of age⁶. In trichotillomania, hair pulling mainly occurs but is not limited to scalp (72.8%), eyebrows (56.4%), and pubic region (50.7%).⁷ Individuals suffering from trichotillomania report poor quality of life, which limits their daily activities ranging from career, recreation to relationships and suffer from comorbid depression and anxiety.⁸

CASE REPORT

A 9-year-old female with a mild speech delay and a genetic predisposition to psychiatric issues was initially diagnosed with ADHD by her primary care physician. She initially tried Dexmethylphenidate XR up to 15 mg, but experienced impulsive behaviors such as pulling her eyebrows. Consequently, she was switched to Amphetamine/dextroamphetamine XR, titrated up to 20 mg, which helped with some symptoms but did not fully address inattentiveness, forgetfulness, and difficulty concentrating and organizing. Although her hair pulling reduced with the medication change, she developed a loss of appetite and associated weight loss.

Upon the first visit to the current office, the patient was on a medication break for the summer. A psychiatric evaluation revealed ongoing hyperactivity and inattentiveness, both at home and school. While hair pulling had decreased, she reported nightmares of death and difficulty sleeping. Mild anxiety and auditory hallucinations were also observed. Other psychiatric conditions were ruled out, and a trial of guanfacine, a non-stimulant, at 0.5 mg twice daily was initiated for ADHD, hair pulling, and sleep issues.

At the subsequent visit, there was an improvement in hair pulling and sleep, but focus and concentration remained problematic. Consequently, the patient was reintroduced to Amphetamine/dextroamphetamine XR at 20 mg, and the evening dose of Guanfacine was increased to 1 mg. Unfortunately, eyebrow pulling worsened, leading to a reduction in Amphetamine/dextroamphetamine XR to 10 mg, and an increase in Guanfacine to 1 mg twice daily for a month. However, her hair pulling did not improve, prompting a 10-day cessation of stimulants. This resulted in decreased impulses to pull hair, and the patient showed significant improvement, with hair growth observed on the eyebrows. Subsequently, the patient was started on Atomoxetine, gradually increasing to 40 mg on subsequent visits. She reported no impulses to pull eyebrows, and her ADHD symptoms were well-controlled.

DISCUSSION

Stimulants, which act by increasing dopamine and serotonin concentrations, may be linked to trichotillomania. The methylphenidate (MPH) inhibits reuptake from the synapse, while amphetamine class (AMP) inhibits the reuptake and actively secretes dopamine and serotonin from the presynaptic cleft, mirroring the underlying mechanism of trichotillomania. This prompts consideration of potential trichotillomania

symptoms following stimulant use, with MPH and AMP identified as the most associated drugs. This side effect is exhibited in varied doses and onset times. Prior studies suggest symptoms may emerge within the first week and even with minimal doses.⁹ Usually, the prevalence of trichotillomania is prevalent in females, still the cases of stimulant-induced trichotillomania predominantly involve males, possibly due to the higher prevalence of ADHD and stimulant use in the male population.^{10,13} However, this study deviates from the norm, focusing on a 9-year-old female with no prior trichotillomania episodes. Given the limited number of existing reported cases, this study contributes significant data supporting a positive causal relationship between stimulant use and trichotillomania.

The mechanism underlying stimulant-induced trichotillomania is difficult to explain due to inconsistent reports and a poor hereditary propensity. Confirming the impact of genetic variants or polymorphisms and pharmacological modes of action that may contribute to compulsive behaviors requires more research. Further research on age and sex-specific analysis is necessary because the cases are found in a range of age groups and sexes. This research could be useful in the development of tailored treatment plans. To identify potential connections to variations in hormone levels or neurobiology, longitudinal research is required. Additionally, the research that is now available shows a range of outcomes, from self-resolution while taking medicine to persistence even after stopping it. Research limitations in this instance could include the small sample size and isolated findings. Nonetheless, the observation of a decrease in trichotillomania symptoms when substituting atomoxetine, a non-stimulant, for dextroamphetamine-amphetamine at a lower dosage highlights possible routes for intervention. The long-term effects of stimulant-induced trichotillomania, the likelihood of relapse, and possible biomarkers are likewise the subject of very few studies. Therefore, more research with bigger sample sizes may improve the quality of the evidence. There is importance of patient counseling, the need to inform individuals about potential side effects and offer the option to transition from stimulant to non-stimulant medications if deemed necessary, aligning with a patient-centered approach to care. Also, there should be continuous monitoring for compulsive behaviors in the patients on stimulant medications to provide early interventions and long term psychological consequences. Parents or care-givers should be educated regarding the potential side effects and early signs of the patients at home.

Table 1: Summary of existing literature

Author/ Year/Country	Age in years/ Sex	Design (N)	Drug	Timing of onset	Course of symptoms	Areas of hair pulling	Conclusion
Martin et al. (1998) USA ¹¹	7-12/M	Case Report (1)	Unknown dose of MPH	Within 6 months of initiation	Spontaneously resolved in 4 months despite continuing MPH	Scalp, eyebrow, eyelashes	Self-resolved with continuation
		Case Report (2)	Unknown dose of MPH	Within 6 months of initiation	Symptoms diminished but did not lessen com- pletely during ongoing maintenance on MPH.		Diminished after d/c
		Case Report (3)	Unknown dose of MPH	Within 6 months of initiation	Chronic symptoms (>2 years), despite a switch to imipramine after 3 months of MPH therapy		Persisted even after d/c
Hamalian & Citrome (2010) USA ¹²	26 yrs. / M	Case Report	AMP salts	Unclear due to non-compliance and long history	Developed compul- sive hair pulling with associated delusional thoughts	Inguinal region and lateral sides of the scalp	Symptoms resolved with stopping of stimulants and initiation of olanzapine
Narine et al. (2013) USA ¹³	12 yrs. / F	Case Report	Adderall 10 mg XR daily	With initiation of medication	No hair pulling at 1 year follow up after discontinuation of Ad- derall and initiation of Guanfacine	Frontal and temporal scalp	
Kara & Akal- tun (2017) Turkey ¹⁴	9 yrs. / M	Case Report	Unknown dose of ER MPH	Within 1 week of initiation	No hair pulling in subsequent follow up after discontinuation of MPH and initiation of atomoxetine	Vertex	
Serkan (2017) Turkey ¹⁵	8 yrs. / M	Case Report	ER MPH 20 mg daily	Within 1 month of initiation	No hair pulling with discontinuation of MPH, reoccurring with MPH 10mg.	Temporoparietal region	
Taranjeet et al. (2022) USA ¹⁶	9 yrs. / M	Case Report	Lis-dexam- phetamine (LDX) 30mg daily	With the initiation of medication	Admission to IP psych unit, discontinue LDX and start Guanfacine and Sertraline	Tonsure pattern hair loss, Eyebrows	

CONCLUSION

Trichotillomania induced by stimulant use is a rare side effect that can manifest regardless of the dosage or duration of treatment. While existing evidence primarily highlights this uncommon association in male pediatric populations, this case report details the experience of a 9-year-old female who exhibited hair-pulling tendencies, particularly targeting her eyebrows, following the administration of dexamethylphenidate and dextroamphetamine-amphetamine. It is crucial, however not to undermine the recognized benefits of stimulant

medications in effectively treating attention deficit hyperactivity disorder (ADHD) in the pediatric population based solely on this isolated report. We advise prescribers to be more cautious and provide patients with comprehensive information about possible adverse effects and non-stimulant pharmaceutical alternatives. Further research, ideally with a larger sample size, is warranted to establish a more definitive association between stimulant use and trichotillomania.

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