

# Trichotillomania in Children

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## Key Words

Pediatric trichotillomania · Childhood · Hair · Hairpulling · Alopecia · Treatment

## Abstract

**Background:** Trichotillomania is an often underdiagnosed condition. Little is known about trichotillomania in childhood. We aimed to analyze the characteristics of children with trichotillomania to increase information on this condition. **Methods:** A retrospective study of an electronic database was performed in a tertiary children's hospital. Information from patients with trichotillomania was systematically classified under the categories 'who', 'what', 'when', 'where', 'why', and 'how'. **Results:** A total of 33 patients had a diagnosis of trichotillomania (28 females, 5 males; peak age between 3 and 4 years). Scalp involvement was most common and nail biting was observed in 5 patients. Only 51.5% of patients had parents who noticed their child's hairpulling. Hair on or under the bed was the most common clue suggesting that hairpulling occurred. Triggering factors identified in 16 children included physical appearance, family-related issues, school-related issues, and concurrent illness. The noninvasive hair pull test was negative in all children. There was a high non-follow-

up rate, and treatment outcomes varied. **Conclusion:** A set of 6 specific questions, based on the '5Ws and 1H' principle, facilitates the gathering of important information on children with unexplained nonscarring hair loss and helps clinicians be cognizant of possible outcomes of trichotillomania. This will be especially useful to clinicians who are not familiar with this elusive condition.

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## Introduction

In the past decade, increased attention has been given to trichotillomania, mainly within psychiatric and psychological circles. Faced with a child with nonscarring alopecia of uncertain etiology, the differential diagnosis must be explored for other underlying causes of hair loss. There is a need for a simple and easily applicable diagnostic and management approach that can be utilized in the clinic when confronted with such a scenario.

By providing a case series of children diagnosed with trichotillomania, with emphasis on systematic categorization of questions to ascertain all clinical aspects of this condition, this article aims to add to the limited literature

on trichotillomania in childhood. We also introduce a set of 6 specific questions, based on the '5Ws and 1H' principle, to facilitate thorough and critical information gathering for the diagnosis of trichotillomania. This will be especially useful to clinicians who are not familiar with this elusive condition.

## Materials and Methods

A retrospective chart review was carried out in the pediatric dermatology outpatient clinic of the Erasmus MC-Sophia Children's Hospital, Rotterdam, the Netherlands. A search of the electronic database of diagnosis codes and intercollegiate consult letters was performed using the key word 'trichotillomania'. Information was obtained from both the scanned written and electronic medical records of patients born between 1990 and 2010. Patients were considered to have trichotillomania only if this was the final diagnosis of the attending physician after at least one follow-up session.

## Results

The database search generated 62 patients. Thirty-three patients had a final diagnosis of trichotillomania. Twenty-nine patients had a diagnosis other than trichotillomania, including alopecia areata (n = 11), traction alopecia (n = 2), premature graying (n = 1), androgenetic alopecia (n = 1), telogen effluvium (n = 1), syndrome-related hair loss (n = 1 with Kallmann syndrome, n = 1 with trichorhinophalangeal syndrome), unspecified hair disorder (n = 3), and unclear diagnosis (n = 8). The characteristics of the 33 children with trichotillomania are described in table 1.

## Discussion

Trichotillomania has previously been classified as an impulse control disorder in the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR) [1]. This criterion, applied to adults and children alike, included an increased sense of tension immediately prior to hairpulling and subsequent pleasure or gratification when hair is pulled. However, many patients, and in particular children, do not describe this phenomenon of tension and gratification related to the hairpulling [2–5]. Therefore, in the recently released DSM-V criteria, trichotillomania is included among 'obsessive-compulsive and related disorders' [6].

**Table 1.** Characteristics of 33 children with trichotillomania

<i>Sex</i>	
Female	28
Male	5
<i>Referring physician</i>	
General practitioner	15
Dermatologist	14
Pediatrician	2
Psychiatrist	2
Ophthalmologist	1
<i>Site(s) of hair loss</i>	
Scalp (vertex, frontal, occipital scalp in decreasing order)	30
Eyelashes	3
Eyebrows	1
Single site affected	32
Two sites affected	1
<i>Associated problems</i>	
<i>Hair problems</i>	
Thin hair	2
<i>Skin problems</i>	
Atopic eczema	7
Nevus flammeus on cheek	1
Epidermal nevus on upper lip	1
Café-au-lait macules and neurofibromas	1
<i>Body-focused repetitive behaviors</i>	
Nail biting	5
Trichophagia	0
<i>Medical problems</i>	
Growth retardation with short stature	3
Asthma/hay fever	3
Syndromes <sup>1</sup>	3
Brain tumor	1
Recurrent adenotonsillitis	1
Recurrent bronchitis	1
Ventricular septal defect	1
Recurrent urinary tract infections	1
<i>Age at onset of hair loss</i>	
Average age	5.5 years
Peak age group	1–2 years
<i>Age at diagnosis of hair loss</i>	
Average age	6.3 years
Peak age group	3–4 years
<i>Parents noticed hairpulling in child</i>	
Yes	17
No	16
<i>Activities surrounding hairpulling in child</i>	
Sleep	2
Tension	7
Fatigue	2
At rest	12

**Table 1** (continued)

<i>Clues suggesting when hairpulling occurred<sup>2</sup></i>	
Hair on or under the bed	7
Hair on clothes	1
Clumps of hair on the floor	1
Child's twisting of own hair	2
<i>Triggers for hairpulling</i>	
Physical appearance	6
Epidermal nevus on upper lip	
Nevus flammeus on cheek	
Short stature	
Pierre-Robin sequence	
Family-related issues	11
Death or illness of family member	
Parental separation	
Parents with hairpulling or nail-biting habit	
Munchausen syndrome by proxy	
School-related issues	5
Picked on by teacher	
Bullying by other children	
Concurrent illness	3
Brain tumor with recurrent hospital admissions	
Flare of eczema	
Recurrent abdominal pains	
<i>Psychiatric or psychological problems</i>	
Attention deficit hyperactivity disorder	3
Behavioral problems	4
Anxiety	3
Speech problems	5
Sleep problems	1
<i>Investigations</i>	
Hair pull test (negative in all)	33
Hair morphology	7
Broken hairs in 7; trichorrhexis nodosa in 1 (incidental)	
Trichogram	14
Reduction in telogen hairs in all	
Increase in dysplastic hairs (9), dystrophic hairs (3) or broken hairs (5)	
Fungal scrape (negative in all)	3
Full blood count (normal in all)	6
Thyroid-stimulating hormone, iron (normal)	1
<i>Outcomes</i>	
Lost to follow-up	19
Successful treatment <sup>3,4</sup>	10
Woolly toy (1 in combination with a psychologist, 1 in combination with melatonin)	6
Education alone	2
Laser therapy for nevus flammeus	1
Psychiatric treatment	1
Treatment failed <sup>3</sup>	4
Woolly toy (1 in combination with melatonin and NAC)	3
Education alone	1

The 'Kipling method', also known as the '5Ws and 1H' method, is a systematic problem-solving procedure which utilizes a set of questions whose answers are considered basic in information gathering. Careful examination and documentation of each aspect of the problem are performed in a standardized way to ensure that all crucial information is gathered. The application of this method has been advocated for approaching conditions in which clinical information may be masked, such as in cases of physical abuse in children [7]. It has never been applied in trichotillomania, other habit disorders or self-mutilation.

Considering the information gathered in this series, we have devised 6 specific questions based on the '5Ws and 1H' principle. This is especially useful for clinicians who are unfamiliar with the condition. When incorporated into an algorithm (fig. 1, 2), the clinician is able to gather crucial clinical data to support the diagnosis of trichotillomania. The characteristics of the patients in our series will also give the clinician an idea of a typical profile of pediatric sufferers of trichotillomania and thereby the possible answers to these questions.

Our pediatric cohort showed a marked predominance of females. Even when older preadolescent children (>9 years) were excluded, there was still a female predominance. This is in contrast to the literature where previous pediatric reports demonstrated an equal gender distribution [8–10]. We postulate that female children may be more prone to pull their hair as they tend to internalize behavior to cope in a stressful situation, compared to male children who tend to externalize behavior and act out [11, 12]. The different coping strategies between the genders may be influenced by biological (for example, the hypothalamic-pituitary-adrenal axis and the serotonin system) and/or social factors.

Nail-biting was concurrent in only 5 patients (15.1%) but has been associated with trichotillomania in 15–20%

(Footnote for Table 1.)

Figures are numbers unless indicated otherwise.

<sup>1</sup> Syndromes: Hennekam, Pierre-Robin sequence, neurofibromatosis.

<sup>2</sup> Of the 16 parents who never noticed their child pulling his/her hair, 6 parents (38%) did notice some of these clues.

<sup>3</sup> All patients received education on trichotillomania.

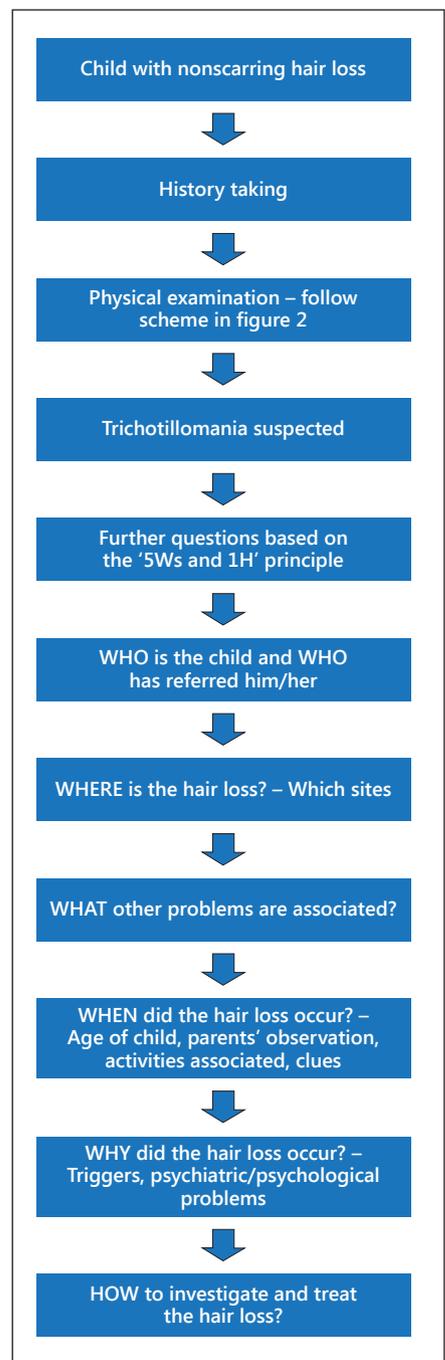
<sup>4</sup> Continued improvement or complete cure between 6 and 24 months.

of children in other pediatric series [3, 8, 13]. Comorbid repetitive stereotypic movements, also referred to as body-focused repetitive behaviors, have been noted in up to 42% of pediatric trichotillomania samples. It is fascinating why a child who displays body-focused repetitive behaviors should focus on hair and not on other easily accessible body parts, such as the nails. There were no children in our cohort who practiced trichophagia, which has been reported in up to 10% of children [3].

The majority of studies on trichotillomania to date have focused primarily on adults and adolescents and indicate that the most common age of onset is in pre- or early adolescence (9–13 years) [5, 8, 10, 14, 15]. However, it is known that trichotillomania frequently occurs in early childhood and has been reported from as early as 12 months of age [3, 16–18]. The peak age at onset of hair loss in our cohort was 1–2 years (36%) with an average age of 5.5 years suggesting that the onset of the hairpulling behavior is also common in this younger preschool age group.

A patient's age can influence the mechanism of his/her hairpulling. Two distinct types of hairpulling have been described for trichotillomania: automatic and focused pulling [19, 20]. Automatic pulling occurs outside of one's own awareness, while focused pulling, in contrast, occurs in awareness and in response to negative emotional states (stress, sadness, anger or anxiety), intense thoughts or urges, or in an attempt to establish asymmetry [21]. Children more often fall in the automatic category, and therefore, they do not recall the actual pulling, but may admit to 'playing with hair' or they have been noted to pull their hair in a trance-like, disengaged state [13, 22]. Two children in our series were never observed to have pulled their hair but instead to have twisted and played with it. Panza et al. [4] demonstrated a developmental progression of the symptoms, with a significant increase in focused hairpulling with advancing age, while automatic pulling remained constant. Older children became more aware of their hairpulling urges and were less able to refrain from pulling [5].

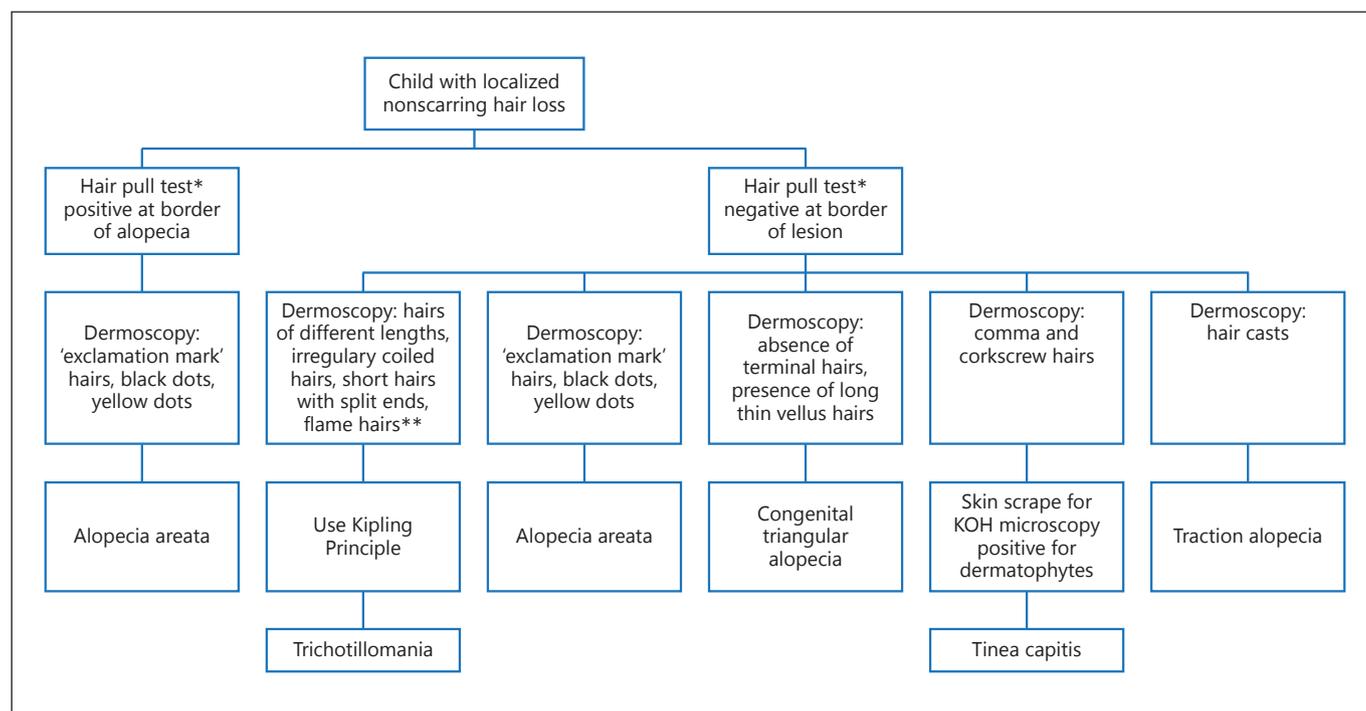
Only 17 patients (51.5%) had parents who actually noticed when their child's hairpulling occurred. It is well-known that parents seldom notice the hairpulling behavior in pediatric trichotillomania. Even if they do, many do not believe that their child's own actions are the cause of his/her hair loss. The fact that children tend to pull their hair when alone or in relaxed surroundings makes their actions even less obvious to people around them [8, 22]. Our findings of many children who pulled their hair while at rest are in accordance with this observation. In-



Color version available online

**Fig. 1.** Algorithm for the approach to a child with nonscarring hair loss.

terestingly, only 2 patients had parents who noticed their child's actual hairpulling during their sleep; however, more parents noticed clues such as hair on or under the bed, which suggested that these patients also pulled their hair while sleeping. Physicians must consider the possi-



**Fig. 2.** Algorithm for the physical examination of a child with nonscarring hair loss. \* = Hair not washed for 3 days prior to the examination; \*\* = 'Exclamation mark' hairs and black dots may also be seen in trichotillomania.

bility of 'sleep-isolated trichotillomania' as patients and parents alike may not be aware of this phenomenon [23]. Of note, a survey of dermatologists showed that only 24% would ask patients who deny hairpulling while awake if they pull their hair during sleep [24]. Direct questioning by physicians, such as 'have you ever noticed hair on or around your child's bed?', may lead parents to reveal this striking observation. Similar questioning about visible hair on clothes or on the floor, etc. could allude to when hairpulling occurs.

The etiology of trichotillomania is complex. Triggers were associated with the onset of trichotillomania in 16 children (48.5%). Family-related issues accounted for the majority of the patients' troubles, which is in agreement with the literature [3]. Interestingly, 2 children had parents who also pulled their own hair, and 1 had parents with Munchausen syndrome by proxy. Hairpulling in these children likely mirrored the actions of their parents, emphasizing that the home environment and close family have a great influence on a child's behavior. Patients with hairpulling behavior triggered by physical appearance tended to be older. Starting a new school, poor performance, bullying and strained teacher-student rela-

tionships were causes of hairpulling in 5 children. Therefore, in these situations, trichotillomania may be interpreted as a symptom of an underlying psychosocial problem of the child, rather than a separate disease.

Gershuny et al. [25] reported a higher prevalence of posttraumatic stress disorder and a history of traumatic events in adult trichotillomania sufferers. Trichotillomania may serve as a form of coping vis-à-vis self-soothing in these traumatized individuals. The high prevalence of associated stressful triggers in our cohort and other pediatric series highlights that stress similarly plays a role in hairpulling in childhood [12, 26]. It has been postulated that pulling could produce a 'counter-irritation' to emotional distress [27]. Yet, many patients pull their hair in times of apparent relaxation when alone and in relaxed surroundings, i.e. in situations where they are not directly exposed to a stressor [22, 28]. This suggests that stress may act as a triggering factor for hairpulling, but the child can subsequently be conditioned to perform the behavior in particular recurrent nonstressful situations such as while watching television or when in bed.

As highlighted in figure 2, the hair pull test is a simple, easily performed bedside test that is acceptable to patients

and parents. Gentle traction is exerted on a group of hairs (about 20) in 3 different areas of the scalp. The test is considered positive if more than 5 hairs are extracted. All patients in our cohort had a negative pull test. The pull test is especially useful to differentiate trichotillomania from alopecia areata where patients would present with a positive test in the active disease phase. If alopecia areata is not in the active phase, the pull test is negative; however, regrowing hair should be visible sooner or later. One should reconsider a primary diagnosis of alopecia areata and suspect trichotillomania instead, if the test remains persistently negative or if regrowing hairs are not present on serial follow-ups.

Dermoscopy, a fairly recently available bedside tool, could be ideal for examining pediatric skin lesions as it poses no physical discomfort or emotional distress. Dermoscopic features of trichotillomania include coiled hairs with frayed ends, short hairs with trichoptilosis (split ends), and flame hairs [29].

The large number of patients who were lost to follow-up demonstrates a significant difficulty in treating trichotillomania. Unacceptance of the diagnosis with subsequent lack of confidence in treatments administered is a major factor in the failure to follow up. Therefore, one of the foremost priorities in managing a child with trichotillomania is how to convince parents of the diagnosis and win their trust in a sound and clear management plan. This is especially critical when only 18% of American dermatologists in a recent survey reported a clear understanding of psychodermatology [26]. We propose the '5Ws and 1H' principle as a means to empower clinicians to be confident in making a diagnosis of trichotillomania and subsequently managing it.

A treatment plan can be formulated once the patient is comprehensively evaluated. In 2008, the Child and Adolescent Trichotillomania Impact Project (CA-TIP) indicated that less than half of the children treated for trichotillomania had improved in terms of their hairpulling symptoms. Since then, more evidence has surfaced to lend support to specific treatment approaches [30].

Behavioral therapy (BT), in particular, is promising and comprises the backbone of therapy in pediatric trichotillomania [31]. A randomized controlled trial showed that BT led to a significant reduction in hairpulling symptoms in children with trichotillomania and that treatment gains were sustained after treatment [32]. This lack of relapse in children stands in contrast to adult trials for BT, which showed that relapse is common after treatment discontinuation, suggesting that treatment of trichotillomania in childhood or adolescence may be as-

sociated with more durable outcomes than treatment during adulthood [33, 34]. Indeed, patients who improved (from any treatment modality) in our series tended to be younger (8/10 or 80% were aged <5 years), which suggests that a younger age at onset is indeed a good prognostic factor. Despite the lack of robust research on BT in very young children, case reports suggest favorable responses. Severe hairpulling was eliminated in a 2-year-old child with the implementation of response prevention consisting of a sock over the child's hand and a brief timeout if the unwanted behavior was performed [17]. Our experience with the use of a woolly toy is encouraging. Parents are advised to acquire a woolly toy with physical characteristics similar to the child, with the aim of allowing the child to pluck the toy's hair while leaving his/her own hair alone. This approach allows children to have an outlet to release their urge to pull hair without performing it on themselves [35]. It also validates the diagnosis to the parents as they are able to witness the behavior in question. In older children, the use of Band-aids on distal index fingers may increase the awareness of their hairpulling behavior. Such simple behavioral interventions are easily administered in the outpatient dermatologic or pediatric clinical setting.

Pharmacotherapy for pediatric trichotillomania has shown mixed results. Selective serotonin-reuptake inhibitors are ineffective in reducing hairpulling symptoms per se, while the opioid antagonist naltrexone and the atypical neuroleptic olanzapine show some efficacy [31]. However, the side effects of these drugs engender caution for their use as a first-line option in children. In contrast to its efficacy in adults, a recent randomized controlled trial showed no benefit of N-acetylcysteine (NAC) for the treatment of trichotillomania in children [36]. NAC treatment was used unsuccessfully in 1 of our patients; this was a 7-year-old girl who failed to respond to both BT (woolly toy) and pharmacotherapy (melatonin and NAC). She was subsequently referred to a psychiatrist. A combined treatment approach of BT and pharmacotherapy is encouraging, but awaits validation in further trials [37].

In conclusion, many clinicians may face a discouraging roadblock when confronted with a child with seemingly puzzling nonscarring hair loss. This study presents a wealth of information on characteristics of children suffering from trichotillomania. By utilizing the '5Ws and 1H' method to approach hair loss which cannot be explained by a somatic cause, clinicians are better equipped to gather important data and are cognizant of the possible outcomes, thereby lending support to a possible diagnosis of trichotillomania. This is crucial to better understand

this disease which will in turn better equip clinicians to find a suitable treatment and guide the patient and his/her parents towards it. Our hypothesis is that relapses in trichotillomania will be less frequent when utilizing the '5Ws and 1H' approach combined with an adequate explanation to patients and/or parents.

## Disclosure Statement

The authors report no conflicts of interest.

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