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# An Open-Label Pilot Study of Naltrexone in Childhood-Onset Trichotillomania

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## ABSTRACT

*Objective:* **This pilot open study evaluates the safety and efficacy of naltrexone in the management of patients with childhood onset trichotillomania (TTM).**

*Methods:* **A total of 14 patients with childhood-onset TTM were treated with naltrexone (25–100 mg/day) and were assessed at each visit for frequency of hair pulling, urge to pull hair, and symptom severity. Liver function was monitored during the treatment. The duration of the study was 10 months.**

*Results:* **A mean dose of 66.07 ± 22.23 mg/day naltrexone was well tolerated and 11 out of 14 subjects showed a positive response. The mean age of the children was 9 ± 1.88 years. The mean age of onset of symptoms in the group was 7.07 ± 0.91 years. No abnormality in liver function was noted in the study. No adverse effects were reported by the children.**

*Conclusions:* **This encouraging pilot open study has promising findings suggesting the use of naltrexone in childhood-onset TTM. However, results are needed from larger and more definitive trials before any conclusions are made.**

## INTRODUCTION

TRICHOTILLOMANIA (TTM) IS A POORLY UNDERSTOOD disorder that is defined by the irresistible urge to pull out one's hair. The prevalence of TTM in children is probably underestimated due to its secretive nature as well the fact that this disorder is on a continuum with other impulse control and obsessive compulsive spectrum disorders in childhood. Hair pulling is a behavior that ranges from a benign form that provides no cosmetic damage to a very severe form that leads to disfigurement and personal suffering (Christenson et al. 1991; Graber and Arndt 1993). Most estimates of the prevalence of TTM have been crude because there have been few surveys on the condition. Up to 10% of people have engaged in hair pulling at some time in their lives (Christenson et al. 1991). The lifetime prevalence of *Diagnostic and Statistical Manual of Mental Disorders*, 3rd edition, revised (DSM-IIIR) (American Psychiatric Association 1987) TTM ranges from 0.6 to1.6%; using less stringent criteria, the prevalence of TTM may be as high as 4% (Azrin and Nunn 1977; Tay et al. 2004). The mean age of the onset of the disorder is 9–13 years, although hair pulling without any emotional distress may occur in smaller children (<5 years) (Christenson 1995; King et al. 1995).

Some children with TTM report urges to pull their hair that occur many times a day. For such

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children, there is a reduction in tension after hair pulling. They often scrutinize, tug, and stroke their hair before pulling it. In a case series of children with TTM, it was reported that hair pulling amongst children may occur as tufts or single hairs for at least 1 hour a day (Reeve 2000).

The management of childhood-onset TTM is a difficult task. There are no pharmacological trials of drugs in childhood-onset TTM and no Food and Drug Administration (FDA)-approved drug therapies for the same. Selective serotonin reuptake inhibitors (SSRIs) and typical and atypical antipsychotics have all been used in anecdotal case reports, with no success reported in any major drug class (Orange et al. 1986; O'Sullivan et al. 1999). Research techniques have included genetic and co-morbidity studies, neuropsychological testing, and structural or functional neuroimaging. Cerebrospinal fluid, pain thresholds and pharmacological probes have also been studied. Some investigators argue in favor of a biological relationship of TTM to obsessive compulsive disorder (OCD) (Swedo and Rappaport 1991), whereas others may not support the same view. (Bienvenu et al. 2000; Stein 2000).

The core symptom in TTM is hair pulling without regard for all of the negative consequences, even pain. Thus, the opioid system may show some impairments in TTM. Opioid antagonists have been used in the management of urge-related disorders like alcoholism and pathological gambling (Volpicelli et al. 1992; Kim and Grant 2001). Naltrexone has been useful in the management of adult kleptomania. There are only two anecdotal reports of the use of naltrexone in the management of TTM, both with modest success. Only one of these reports concerns childhood-onset TTM (Holtum et al. 1994; Carrion 1995; Grant 2005). This study was undertaken to gather preliminary data on the efficacy of naltrexone in the management of childhood-onset TTM in children treated in a psychiatric outpatient clinic.

## METHODOLOGY

In all, 14 consecutive outpatient children (9 girls and 5 boys) with TTM as their primary diagnosis as per DSM-IIIR criteria were included in the study. Children receiving only naltrexone as monotherapy were included in the study. Children who were receiving concomitant cognitive behavioral therapy or psychotherapy were excluded from the study. Children with other Axis I or Axis II DSM diagnoses were also excluded from the study.

All of the children were already undergoing treatment at the center, and those children that met our criteria were then selected for the study. A total of 33 children were screened and 14 were selected for the study. Baseline information included present age, age of onset of TTM, frequency of hair pulling, and intensity of the hair pulling urge. The TTM assessment was done using the Clinical Global Impressions Scale (CGI) (Guy 1976).

The children in the study were initially started on naltrexone at 25 mg/day: after a week, when the medication was tolerated well, the dosage was increased to a maximum of 100 mg on the basis of symptom evaluation and response during a period of 2 weeks. Once enrolled into the study, the children were evaluated clinically for improvement every 2 weeks. Liver function was evaluated monthly for the first 2 months and every 2 months thereafter. The clinical evaluation was done at every visit using the CGI-Severity (CGI-S) scale. The scale has 7 items from "not ill at all" to "extremely ill." The children were asked at each visit about the frequency of hair pulling (per day) and intensity of the urge to pull their hair (per day), which was rated on a 5-point scale (nil to extreme symptoms based on the number of times hair was pulled and number of times an urge to pull was experienced along with the intensity of the urge on a daily basis). For the study, the scores at the start and end of the 10-month period were taken into consideration. All scores were corroborated and confirmed by parents, and a consensus was reached on the scores. A CGI-S score of 2 or less was considered as a response.

Parents of the children were informed of the study and the need for monitoring liver function while on naltrexone therapy. Parents were also informed about the lack of efficacy trials with any medication groups for TTM (Walsh and McDougle 2005).

Changes in the CGI-S scores, urge intensity, and hair pulling frequency between baseline and final treatment visits were compared using paired *t*-tests (two-tailed). A $p$ value of $< 0.05$ was considered significant. A positive response was considered as a 50% reduction in the urge to pull hair and hair-pulling frequency.

## RESULTS

A total of 33 children were screened and 14 children that met our criteria and were on naltrexone alone were included in the study. The mean age of the children was $9 \pm 1.88$ years. More girls than boys were part of the study. At the final visit 8 children showed improvement in hair pulling and 3 reported no hair pulling at all. Reduction in CGI-S, hair pulling, frequency and urge intensity for hair pulling on the basis of the mean scores was reported to a significant extent in the group (Table 1) ($p < 0.0001$). The mean age of onset of symptoms in the group was $7.07 \pm 0.91$ years.

The mean dosage of naltrexone for the group was $66.07 \pm 23.22$ mg/day. On assessing the age of onset as a variable for reduction of symptoms, the variable did not have a significant association with response to medication. None of the children had elevated liver enzymes while on treatment. None of the children reported any adverse effects due to the drug. The majority of patients in the study responded to naltrexone (78.57%).

## DISCUSSION

TTM has been characterized as a disorder of the obsessive compulsive spectrum due to purported neurobiological and phenomenological similarities (Swedo and Leonhard 1992). There are no drugs that have been proven useful in the management of childhood-onset TTM. Biological mechanisms of impulse control disorders focus on the orbitofrontal cortex, nucleus accumbens, and ventral tegmental nucleus (O'Sullivan et al. 1998). Naltrexone acts by an antagonist action on the mu opioid receptors, the opioid system concerned with processing of reward, pleasure, and pain (Matthews and German 1984). Naltrexone may act via this system in the management of impulse control disorders.

This pilot study has a number of limitations. The sample size was small and there was no control group. An open trial may contribute to an element of rater and patient bias on the improvement measures used here. By ruling out co-morbidity, we have ensured that the improvement is primarily due to improvement of TTM alone and not a secondary improvement in TTM seen as a result of the improvement of a co-morbid psychiatric disorder that may have been present. The three outcome measures used have psychometric shortcomings. The scale used to measure improvement is the CGI-S scale whereas a CGI–Improvement scale may have been more appropriate. The scale used in the study measures response and not a specific change in behavior. There is also a failure on the part of the author to use photographic evidence that could have been blindly rated.

This pilot study provides encouraging results regarding the efficacy of naltrexone in the management of childhood-onset TTM. Clearly, larger, randomized, placebo-controlled, double-blind trials are warranted to answer questions of efficacy and safety more definitively.

Table 1. Treatment Response to Naltrexone ($n = 14$)

| *Outcome measure* | *Baseline visit mean SD* | *Final visit mean SD* | t *value (df = 13)* | p *value* |
|---|---|---|---|---|
| CGI-S | $5.9 \pm 0.9$ | $2.4 \pm 1.1$ | 9.2142 | <0.0001 |
| Hair pulling frequency | $3.6 \pm 0.8$ | $1.1 \pm 0.5$ | 9.9121 | <0.0001 |
| Urge to pull hair (intensity) | $3.9 \pm 0.7$ | $1.2 \pm 1.1$ | 7.7482 | <0.0001 |

Abbreviations: SD = Standard deviation; df = degrees of freedom; CGI-S = Clinical Global Impressions-Severity scale. All statistics were done using the paired *t*-test.

## DISCLOSURE

Dr. De Sousa has no financial ties or conflicts of interest to report.

## REFERENCES

American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, 3rd edition revised (DSM-IIIR). Washington (DC), American Psychiatric Association, 1987.

Azrin NH, Nunn RG : Habit Control in a Day. New York, Simon & Schuster, 1977.

Bienvenu OJ, Samuels JF, Riddle MA, Hoehn Saric R, Liang KY, Cullen BA, Grados MA, Nestadt G: Relationship between obsessive compulsive disorder and other obsessive compulsive spectrum disorders—a family study. Biol Psychiatry 48:287–293, 2000.

Carrion VG: Naltrexone for the treatment of trichotillomania—a case report. J Clin Psychopharm 15:444–445, 1995.

Christenson GA. Trichotillomania—from prevalence to comorbidity. Psychiatr Times 12:44–48, 1995.

Christenson GA, Pyle RL, Mitchell JE: Estimated lifetime prevalence of trichotillomania in college students. J Clin Psychiatry 52:415–417, 1991.

Graber J, Arndt WB: Trichotillomania. Compr Psychiatry 34:340–346, 1993.

Grant JE: Outcome of kelptomania patients treated with Naltrexone. Clin Neuropharm 28:11–14, 2005.

Guy W: ECDEU Assessment Manual for Psychopharmacology. US Department of Health, Education and Welfare Publications (ADM), 1976, pp 76–338.

Holttum JR, Lubetsky MJ, Eastman LE: Comprehensive management of trichotillomania in an autistic girl. J Am Acad Child & Adolesc Psychiatry 33:577–581, 1994.

Kim SW, Grant JE: An open naltrexone treatment study for pathological gambling disorder. Int Clin Psychopharmacol 16:285–289, 2001.

King RA, Scahill L, Vitulano LA: Childhood trichotillomania—clinical phenomenology, comorbidity and family genetics. J Am Acad Child Adolesc Psychiatry 34:1451–1459, 1995.

Matthews RT, German DC: Electrophysiological evidence for the excitation of rat ventral tegmental area and dopamine neurons by morphine. Neuroscience 11: 617–625, 1984.

Orange AP, Peereboom-Wynia JDR, DeRaeynaecker DMJ: Trichotillomania in childhood. J Am Acad Dermatol 15:614–619, 1986.

O'Sullivan RL, Lipper G, Lerner E: The neuro-immunocutaneous network : Relationship of the mind and the skin. Arch Dermatol 134:1431–1435, 1998.

O'Sullivan RL, Christenson GA, Stein DJ: Pharmacotherapy of trichotillomania, In: Trichotillomania. Edited by Stein DJ, Christenson GA, Hollander E. Washington (DC), American Psychiatric Press, 1999.

Reeve E: Hair pulling in children and adolescents. In: Trichotillomania. Edited by Christenson GA, Hollander E. Washington (DC), American Psychiatric Press, 2000.

Stein DJ: Neurobiology of Obsessive Compulsive spectrum disorders. Biol Psychiatry 47:296–304, 2000.

Swedo SE, Leonhard HL: Trichotillomania—an obsessive compulsive spectrum disorder ? Psychiatr Clin North Am 15:777–791, 1992.

Swedo SE, Rappaport JL: Annotation—Trichotillomania. J Child Psychol Psychiatr 32:401–409, 1991.

Tay YK, Levy ML, Metry DW: Trichotillomania in childhood—a case series and review. Pediatrics 113:494–498, 2004.

Volpicelli JR, Alterman AI, Hayashida M, O'Brien CP: Naltrexone in the treatment of alcohol dependence. Arch Gen Psychiatry 49:876–880, 1992.

Walsh KH, McDougle CJ: Pharmacological strategies for trichotillomania. Exp Opin Pharmacother 6:975–984, 2005.

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