

A case of trichotillomania with bulimia: combined with N-acetylcysteine synergistic therapy

Xudong Zhao (✉ zhaoxudong198688@163.com)

Huzhou Third People's Hospital <https://orcid.org/0000-0001-6738-9709>

Shikai Wang

Huzhou Third People's Hospital

Xiujuan Hong

Huzhou Third People's Hospital

shaojia Lu

Zhejiang University First Affiliated Hospital Department of Psychiatry

Sufang Tang

Huzhou Third People's Hospital

Yue Shen

Huzhou Third People's Hospital

Ming Feng

Huzhou Third People's Hospital

Ping Guo

Huzhou Third People's Hospital

Yu Fang

Huzhou Third People's Hospital

Case report

Keywords: N-acetylcysteine, Trichotillomania, Bulimia

Posted Date: April 30th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-430592/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background

Trichotillomania is a common type of obsessive-related disorder characterized by repetitive hair pulling, driven by escalating tension before the action and during the attempts to resist it, and causing variable hair loss. Most clinical treatments for trichotillomania have poor curative effects.

Case presentation

We treated a case of trichotillomania with bulimia with N-acetylcysteine synergistic treatment. The pathological hair plucking behaviour and binge eating symptoms were both significantly improved.

Conclusion

This case suggest that N-acetylcysteine can be one choice as a synergistic or adjuvant treatment for impulse control disorder. Moreover, trichotillomania and bulimia may have a common pathophysiological mechanism.

Background

Obsessive-compulsive and related disorders (OCRDs) are a group of intractable mental disorders in which the pathological mechanism is still unclear and in which the therapeutic effect is unsatisfactory.¹ Additionally, these disorders are independent chapters in the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Therefore, the mainstream anti-obsessive-compulsive treatment of OCD is used with SSRIs, and it is accompanied by the use of cognitive behavioural therapy (CBT) as the first-line treatment; however, most of the efficacy is not good. However, a previous study showed that the effect sizes of OCD treatment were not significant (0.37–1.09 for drug treatment and 0.99–1.13 for CBT); specifically, regardless of whether SSRIs and CBT were used alone or in combination, the effective rate was only approximately 40–60%, and the effect was still not satisfactory, which results in great pain and burden to patients and their families.² According to the medication procedures for obsessive-compulsive disorder of the Harvard Southbank Program (PAPHSS 2019), when there are both enough quantity and enough treatment with first-line drugs and conventional synergistic regimens that have poor efficacy in patients with OCD, glutamate modulators, including NAC, can be selected for use as a synergistic therapy.³

Trichotillomania (TTM) is a common type of obsessive-related disorder characterized by repetitive hair pulling, driven by escalating tension before the action and during the attempts to resist it, and causing variable hair loss. Currently, it lacks specific drugs for treatment.

Herein, we describe a female trichotillomania patient who achieved a good curative effect and who exhibited improvements in her binge eating symptoms after combined NAC synergistic treatment when conventional anti-obsessive therapy was ineffective. This case enriches our clinical experience and

understanding of the application of NAC in patients with trichotillomania combined with a binge eating disorder.

Case Presentation

Mrs A, a 25-year-old woman, came to our hospital because of repeated hair pulling behaviour. Her medical history was collected via a detailed inquiry. More than 10 years ago, the patient was sexually discriminated against by her family and had a bad relationship with her parents. She gradually became unhappy, experienced self-abasement and became nervous, after which she began to repeatedly and uncontrollably pull out her hair, which was more obvious when she was in a bad mood. She had received psychological therapy and drug therapy for many years, but the effects were not good. Nearly a year ago, the condition worsened; she was upset, unhappy and was crying often. Additionally, the hair pulling phenomenon worsened, and she even used nail clippers to pull out the hair follicles on her head, and she had to resort to constantly wearing a wig to cover up the local hair loss. Furthermore, patients encountering increased pressure will exhibit intermittent binge eating attacks, but no emetic, diuresis or diarrhoea behaviour, thus resulting in a significant increase in weight gain. The patient had an obvious impairment in social function and had changed jobs several times. The patient had been successively diagnosed with "obsessive-compulsive disorder", "depression" and "anxiety disorder" in the outpatient department of our hospital. Sertraline tablets (up to 200 mg/day) and vofloxamine tablets (150 mg/day) were used as the main treatments, but the efficacy was still not good.

On admission, the patient had normal vital signs and obesity (BMI: 28.23 kg/m²), and she was wearing a wig. The hair defects in the temporal and occipital regions were obvious, and the local hair follicles in the scalp were red and swollen with oozed blood (see attached figure 1., the local hair defect). After admission, the examination revealed the following: clear consciousness, orientation and complete contact cooperation, denials of auditory hallucinations, the existence of tinnitus, depression associated with anxiety, a low degree of self-evaluation, negative ideas (but no behaviour), emotional response coordination, no obvious body-like obstacles, hypoactivity, poor interest and a good insight. Laboratory and auxiliary tests revealed the following: TG, 5.06 mmol/L; and abdominal colour ultrasound, fatty liver. The psychological tests revealed the following: Y-BOCS, 18 points; HAMA-14:22 points; HAMD-17:18 points; and Eating Disorder Questionnaire (EDI), 245 points. EEG, ECG and head MRI scans showed no obvious abnormalities.

After admission on the basis of the original treatment, the patient was given a combined treatment with NAC, starting at 600 mg and titrated gradually to 1,200 mg (D4) and 1,800 mg (D9). During this period, the patient's anxiety and depression were significantly improved, the obsessive symptoms were alleviated, the hair plucking behaviour was significantly reduced and her binge eating was also significantly alleviated; subsequently, the patient was discharged from the hospital on day 11.

A follow-up 2 weeks after discharge showed that the patient's mood was stable, her anxiety was alleviated, no hair plucking behaviour was observed, her hair was thicker than before and inflammation

was significantly improved. A follow-up 4 weeks after discharge showed an improvement of her obsessive symptoms, no episodes of binge eating and her normal occupation of teaching had resumed. A follow-up 14 weeks after discharge (16 weeks after treatment) showed no obvious obsessive-compulsive symptoms, no episodes of binge eating (BMI: 26.95 kg/m²) and good working and living conditions (drug dosages and scale evaluations used during treatment are shown in Table 1, and changes in local hair defects are shown in Figure 2, Figure 3 and Figure 4).

Discussion

Although the concept of obsessive spectrum disorder has been in existence for a long period of time, there have been disputes about its definition and the category of the disease. At present, trichotillomania is considered a type of obsessive-related disorder, and bulimia is classified as an eating disorder⁴ However, previous family studies⁵ and cross-sectional surveys⁶ suggest that eating disorders are significantly associated with trichotillomania, and the prevalence of trichotillomania in eating disorder patients is much higher than that in the general population.⁷ After the synergistic treatment of NAC, both the pathological plucking impulsivity and the binge-eating episodes of this patient were rapidly relieved, thus suggesting that both of the conditions may have a common pathophysiological mechanism and generate the common psychological characteristics of the symptoms.⁸ In view of the clinical manifestations and treatment outcomes, both of the disorders can be classified as obsessive-compulsive spectrum disorders.

NAC is a precursor of the inhibitory neurotransmitter γ -aminobutyric acid (GABA), which can regulate the synthesis and secretion of glutamate and dopamine and plays an important role in the process of oxidative stress, apoptosis and neuroinflammation.⁹ NAC cysteine compounds (in the reverse adjustment) play an important role in the synthesis of glutamate, with a portion provided by NAC cysteine by the sodium dependent transport mechanism through the blood brain barrier, converted into cystine in the brain, and the latter provided via the cystine-glutamate transporter exchange to glutamate, which causes mGluR2/3 receptor activation and leads to decreased synaptic glutamate release. This restores the extracellular glutamate levels,¹⁰ which can be used for the synergistic treatment of obsessive-compulsive disorder.

NAC is a nutritional supplement. In addition, and throughout the world, many over-the-counter drugs are used. At present, NAC has been widely used in the treatment of respiratory diseases, detoxification and for many types of clinical treatments of severe liver damage, which have high safety and good tolerance. However, for NAC, further application in the treatment of force spectrum disorder disease is expected to be performed by the use of large sample controlled studies in the future.

Conclusion

This case demonstrates that NAC is indeed a synergistic or adjuvant treatment option for trichotillomania, which suggests that trichotillomania and bulimia may share a common

pathophysiological mechanism.

References

1. Huang Y, Wang Y, Wang H, et al. Prevalence of mental disorders in China: a cross-sectional epidemiological study[J]. *Lancet Psychiatry*, 2019, 6(3): 211-224. DOI: 10.1016 / S2215-0366(18)30511-X.
2. bramowitz JS. Effectiveness of psychological and pharmacological treatments for obsessive-compulsive disorder: a quantitative review[J]. *J Consult Clin Psychol*,1997,65(1): 44-52.DOI:10.1037//0022-006x.65.1.44.
3. Beaulieu AM, Tabasky E, Osser DN. The psychopharmacology algorithm project at the Harvard South Shore Program: An algorithm for adults with obsessive-compulsive disorder. *Psychiatry Res*. 2019 Nov;281:112583.
4. Vladan Starcevic et al. Obsessive-compulsive spectrum disorders: still in search of the concept-affirming boundaries. *Current Opinion in Psychiatry* 2011, 24:55-60
5. Laura Bellodi et al. Morbidity Risk for Obsessive-Compulsive Spectrum Disorders in First-Degree Relatives of Patients With Eating Disorders. *Am J Psychiatry* 2001; 158:563-569
6. Erica Greenberg et al. Predictors of Comorbid Eating Disorders and Association with Other Obsessive-Compulsive Spectrum Disorders in Trichotillomania. *Comprehensive Psychiatry*, Vol. 78 (October, 2017): 1-8
7. Nancy Zucker, Ann Von Holle, Laura M. Thornton et al. The Significance of Repetitive Hair-Pulling Behaviors in Eating Disorders. *JOURNAL OF CLINICAL PSYCHOLOGY*, Vol. 67(4), 391-403 (2011)
8. Bonnie J. Sherman et al. Strategic Memory in Adults with Anorexia Nervosa: Are There Similarities to Obsessive Compulsive Spectrum Disorders?. (*Int J Eat Disord* 2006; 39:468-476
9. Henry A. Nasrallah, et al. Glutamate's exciting roles in body, brain, and mind: A fertile future pharmacotherapy target. *Current Psychiatry*. 2017 July;16(7):17-18,20,47.
10. Oliver G, Dean O, Camfield D, et al. N-acetyl cysteine in the treatment of obsessive compulsive and related disorders: a systematic review. *Clin Psychopharmacol Neurosci*. 2015;13(1):12-24. doi:10.9758/cpn.2015.13.1.12

Table

Table 1 Patients' NAC dosages, Y-BOCs, HAMA-14, HAMD-17, EDI scores

	Baseline	D1	D3	D4	D7	D9	4W	6W
NAC dosages [mg]	600			1200		1800		1800
Y-BOCS	18	17	14		11		7	4
HAMA	22	21	17		14		13	8
HAMD	18	16	14		10		9	7
EDI	245	243	221		206		193	183

Figures



Figure 1

Head photo of the patient before admission for treatment (side and back)



Figure 2

Hair profile at follow-up 2 weeks after discharge (side and back)



Figure 3

Hair profile at follow-up 4 weeks after discharge (side and back)



Figure 4

Follow-up of patient's hair 14 weeks after discharge (side and back)