

# Acupuncture in Tourette syndrome: a retrospective study on 435 children

## **Abstract**

**Object:** Observation of the clinical efficacy of traditional Chinese medicine paste in treating Tourette's syndrome in children.

**Method:** A retrospective study was conducted on 435 patients diagnosed with Tourette's syndrome at our hospital from February 2021 to February 2023. There were 206 patients aged from 8 to 14 years, including 180 patients (46.8%) in the patch group and 26 patients (52%) in the non-patch group. The patients were divided into two groups: those who used traditional Chinese medicine patches and those who did not. The clinical efficacy of the two groups was observed. All patients have agreed to the study.

**Results:** In the group using traditional Chinese medicine patches, 167 cases showed marked efficacy, 178 cases showed therapeutic efficacy, and the clinical efficacy was 89.6%, significantly higher than the group not using traditional Chinese medicine patches.

**Conclusion:** Traditional Chinese medicine plaster treatment of tourette syndrome can significantly relieve the condition of children, improve clinical symptoms, clinical efficacy, and has high clinical application value.

**Keywords:** Chinese population; Traditional Chinese medicine

paste; Tourette syndrome.

## **Introduction**

Tourette syndrome (TS) is a neurological and psychiatric condition that typically begins in childhood or adolescence. It is characterized by the presence of simple or complex tics, which are sudden, rapid, repetitive movements or vocalizations that occur rhythmically. TS often becomes noticeable in early childhood and tends to worsen over time, with its most severe manifestations usually occurring around the age of 10 [1]. The clinical features of TS vary with age; while it can develop at any point during childhood, it generally emerges between ages 2 and 18, peaking around age 6. This disorder is more prevalent among males and frequently coexists with other psychiatric and behavioral issues such as obsessive-compulsive disorder (OCD), attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder (ASD), anxiety disorders, depression, sleep disturbances, and self-harming behaviors [2]. Research indicates that up to 88% of individuals diagnosed with Tourette syndrome will experience at least one additional mental health condition in their lifetime, while 58% may be diagnosed with two or more comorbidities [3].

In recent years, along with the increase of psychological stress in children, the incidence of Tourette Syndrome has been rising. If the disease is not controlled in time, it will not only influence their living

quality, but also lead to psychological disease. Therefore, it is essential to adopt a reasonable treatment plan after the clinical diagnosis.

Psychological education is advised as the initial intervention, while behavioral therapy is considered the primary approach for children with Tourette syndrome (TS) [4]. However, both educational and behavioral therapies are primarily aimed at older individuals or children, where there is limited evidence supporting their effectiveness and safety. Medications are suggested as a secondary option but can lead to significant side effects. Additionally, deep brain stimulation (DBS) has been proposed as an alternative treatment for severe tic disorders [5], although its efficacy and safety remain uncertain. Despite various neuroregulatory treatments available—such as repetitive transcranial magnetic stimulation (rTMS), cranial electrotherapy stimulation, and electroencephalography biofeedback—the outcomes of these methods continue to be debated [6]. Consequently, there is a need for a comprehensive therapeutic strategy addressing tic disorders.

In China, several antipsychotic drugs, including traditional Chinese medicine, are used to treat Tourette syndrome. In Western medicine, tiapride, aripiprazole and other drugs are used to treat the children, although they can quickly relieve the clinical symptoms, but there are adverse reactions such as appetite loss and sweating disorders. Under the guidance of traditional Chinese medicine and acupuncture theory system,

acupoint sticking therapy is an external treatment that applies granular drugs to an ear point to achieve therapeutic effects through stimulation .In order to further assess the value of the treatment, we selected 435 cases of patients diagnosed with Tourette syndrome were studied.

## Methods

### Characteristics of the Patients

A retrospective study of 435 patients with Tourette syndrome 2023 diagnosed in our hospital from February 2021 to February 2021 was conducted.Children with and without tic strips were divided into two groups. 385 children with tic strips and 50 children without tic strips were treated.

There were 274 males (71.2%) and 111 females (28.8%) in the Traditional Chinese Medicine(TCM) patch group, and 31 males (62%) and 19 females (38%) in the non-patch group.There were 229 patients aged from 3 to 7 years, including 205 patients (53.2%) in the patch group and 24 patients (48%) in the non-patch group. There were 206 patients aged from 8 to 14 years, including 180 patients (46.8%) in the patch group and 26 patients (52%) in the non-patch group.

**Table 1. Demographic Characteristics of the Patients**

	TCM patch group (%)	non-patch group (%)
Age		
3~7	205 (53.2%)	24 (48%)
8~14	180 (46.8%)	26 (52%)

Gender	Male	274 (71.2%)	274 (71.2%)
	Female	111 (28.8%)	111 (28.8%)

Treatment group: Applied on both sides of Yongquan point and Dahui point, 1 day, 24 h replacement, 1 cycle at 10 d. The control group: The children were given 0.5 mg/time oral haloperidol, taken before bed, 10 d for 1 cycle, and treated for 4 cycles. Healthy Education: Educate the parents to properly deal with the situation of the child, don't scold, abuse, or even scare the hand, teach the parents how to distract the attention.

Excel was used for data statistics and analysis.

## Research result

### clinical symptoms

Among the 385 patients in the TCM patch group, blink was seen in 263 patients, and grin and shrug were seen in 21 patients respectively. In the non-patch group, blink was seen in 28 patients, throat clearing was seen in 15 patients and other clinical manifestations were seen in 15 patients respectively.

Table 2. Clinical symptoms of the Patients

symptoms	Grin	shrug	Kick	Blink	throat clearing	Others
TCM patch group	21	21	2	263		
non-patch group				28	15	15

### Treatment effect

In the TCM patch group, 167 cases were significantly effective (the

tic symptoms were reduced by 75% ),178 cases were medication effective(reduce tic decreased by 50% ), and the clinical efficacy was 89.6%, which was significantly higher than that in the non-patch group.

Group	n	Significant effect	Medication effective	Ineffectiveness	clinical effects
patch group	385	167 (43.4%)	178 (46.2%)	40 (10.4%)	345 (89.6%)
non-patch group	50	14 (28%)	17 (34%)	19 (38%)	45 (62%)

**Table 3. Treatment Effects in the Patients**

### Discussion

But the symptoms of recurrent involuntary seizures associated with TS, such as nodding, blinking, opening of the mouth, lifting the shoulders, lifting the legs, and swelling of the stomach, have been described in many ancient texts.

In TCM, the disease is divided into "spasm syndrome" and "hepatic wind" syndrome. In the period of Neijing, there are a lot of descriptions of spasm syndrome, such as Su Wen Zhi Zhen Yao Da Lun, which states, "All spasms are severe and are caused by dampness." It is also mentioned in the same article that "all violence and violence belong to the wind." In Plain Questions on Five Zang Organs, it is said: "When a man lies down,

his blood flows back to his liver. The liver can receive blood, the feet can walk, the palm can hold blood, and the fingers can absorb blood. "

In Eastern Han Dynasty, Zhang Zhongjing wrote The Outline of the Golden Chamber for the first time to discuss spasticity. During the Ming and Qing Dynasties, the recognition of TCM spasm syndrome was very fast, and a lot of new theories and ideas were proposed. In Qing Dynasty, Ye Tianshi thought that spasm syndrome had close relationship with the liver, and that the liver was a rigid internal organ, governing the tendons, with an ascending and active character<sup>[7]</sup>.

Currently, there is no consensus on the cause and mechanism of TS, and there is no agreement on the diagnosis and treatment of TS. Based on the current knowledge, the etiology and pathogenesis of TS are summarized as follows: The site of Tourette syndrome is mainly located in the liver, and the liver is closely associated with the heart, spleen and kidney. The causes of Tourette Syndrome are various, including birth defects, birth trauma, suffocation, sensory external pathogens, and emotional disorder<sup>[8-9]</sup>.

The guidelines stress that Tourette Syndrome can't be fully treated with Western medicine alone, and there are all kinds of side effects. Thus, there is an urgent need for complementary and alternative treatments to treat Tourette syndrome. Over the long period of time, TCM doctors have gradually discovered that although TCM and acupuncture can have a

therapeutic effect on TS, TCM and acupuncture are more effective and have less side effects<sup>[10]</sup>.

Auricular point sticking is a characteristic therapy of traditional Chinese medicine commonly used in clinical practice. Auricular point sticking can stimulate and enhance the afferent impulses of the vagus nerve, reduce the level of excitatory neurotransmitters such as norepinephrine, and regulate the content of central neurotransmitters such as dopamine, serotonin and  $\gamma$ -aminobutyric acid, thereby relieving anxiety and other effects<sup>[11]</sup>.

In recent years, auricular point sticking is often used as an adjuvant treatment for children with tourette syndrome due to its advantages of simple, easy to learn, safety and low price. The results show that it has an excellent effect.

The results showed that the total effective rate of the patch group was significantly higher than that of the non-patch group. The results showed that plaster of traditional Chinese medicine could obviously relieve the condition of children's Tourette syndrome, improve the clinical symptoms and improve the clinical therapeutic effect.

No significant adverse effects have been observed in previous published studies in patients treated with TCM drugs and acupuncture. The mechanism of Tourette Syndrome is not well understood in modern medicine, and its therapy is limited, and its efficacy is not satisfactory.

TCM, as a component of complementary and alternative medicine, can make up for the deficiency of modern methods. TCM has the features of precise therapeutic effect and high safety, and deserves to be popularized. However, there are few high quality and high level randomized controlled trials in the area of Tourette Syndrome with TCM in China and in the world. Moreover, we should make scientific and rational arrangements for the patients' diet and lifestyle, so as to avoid over-excited, nervous, tired, and concerned about their prognosis.<sup>[12]</sup> Several studies have reported that coping involves the need to integrate tics with identity, exert control over tics, and challenge the misrepresentation of tics in the wider society. A supportive environment from parents and friends allows a person to take pride in his or her ability to control tics, which makes tics a positive integration of identity. Social awareness must be raised through educational campaigns in order to better address the problem of stigmatization. For example, further research suggests understanding how common co-occurring conditions, such as ADHD, affect coping.

### **Conclusion**

Most studies have focused on the effects of convulsions and psychiatric symptoms on the quality of life of TS samples. It must be emphasized that the impact of psychosocial factors, especially family functioning, on the quality of life of TS adolescents needs to be further explored.

### Ethical Approval:

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

### Consent

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

### Disclaimer (Artificial intelligence)

#### Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

#### Option 2:

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology

Details of the AI usage are given below:

- 1.

2.

3.

### References

[1] Leckman JF, Zhang H, Vitale A, Lahnin F, Lynch K, Bondi C, Kim YS, Peterson BS. Course of tic severity in Tourette syndrome: the first two decades. *Pediatrics*. 1998;102(1 Pt 1):14–9.  
10.1542/peds.102.1.14

[2] Conte G, Costanza C, Novelli M, et al. Comorbidities and Disease Duration in Tourette Syndrome: Impact on Cognition and Quality of Life of Children. *Children (Basel)*. 2024;11(2):226. Published 2024 Feb 9. doi:10.3390/children11020226

[3] Hirschtritt M, Lee P, Pauls D, et al.. Lifetime prevalence, age of risk, and genetic relationships of comorbid psychiatric disorders in Tourette syndrome. *JAMA Psychiatry*. 2015;72:325–33.

[4] Andren P, Jakubovski E, Murphy TL, Woitecki K, Tarnok Z, Zimmerman-Brenner S, et al.. European clinical guidelines for Tourette syndrome and other tic disorders-version 20 Part II: psychological interventions. *Eur Child Adolesc Psychiatry*. (2021) 31:403–23.  
10.1007/s00787-021-01845-z

[5] Szejko N, Worbe Y, Hartmann A, Visser-Vandewalle V, Ackermans L, Ganos C, et al.. European clinical guidelines for tourette syndrome and other tic disorders-version 20 Part IV: deep brain

stimulation. *Eur Child Adolesc Psychiatry*. (2022) 31:443–61.

10.1007/s00787-021-01881-9

[6]Liu ZS, Cui YH, Sun D, Lu Q, Jiang YW, Jiang L, et al.. Current status, diagnosis, and treatment recommendation for tic disorders in China. *Front Psychiatry*. (2020) 11:774. 10.3389/fpsyt.2020.00774

[7]Lin K, Wang Y, Wang J, Zhang C, Feng Q. Treatment of Tourette syndrome by acupuncture combined with Chinese medicine based on syndrome differentiation: A review. *Medicine (Baltimore)*. 2023;102(29):e34268. doi:10.1097/MD.00000000000034268

[8]Liu Y, An J, Liu Y. Professor Huang Linna's experience in treating Tourette's syndrome with Fang's scalp acupuncture. *Chin AcupunctMoxibust*. 2019;39:765–70.

[9]Wang S. *Pediatrics of Chinese Medicine* [M]. Beijing: China Traditional Chinese Medicine Press, 2002.

[10]Zhu P, Zuo X, Jiang B, et al.. Sun Shentian's clinical experience in acupuncture treatment of Tourette's syndrome. *Chin AcupunctMoxibust*. 2023;43:261–4.

[11] LIU C H, YANG M H, ZHANG G Z, et al. Neural networks and the anti- inflammatory effect of transcutaneous auricular vagus nerve stimulation in depression [J] . *J Neuroinflamm*, 2020, 17 (1) : 54. DOI: 10.1186/s12974-020-01732-5.

- [12] Melanie Maxwell-Scott <sup>1</sup>, Fiadhnaid O'Keefe <sup>2</sup>, Fiona J R Eccles , **Coping with Tourette's syndrome: a meta-ethnography of individual and family perspectives . 2024**, 1476-8321 : 1-23 【doi】 [10.1080/08870446.2024.2360126](https://doi.org/10.1080/08870446.2024.2360126)
- [13] Kelly H Watson <sup>1</sup>, Michelle Eckland <sup>2</sup>, Jessica M Schwartzman , et al **The Association of Quality of Life with Psychosocial Factors in Adolescents with Tourette Syndrome**[Child psychiatry and human development, 2024 \(1573-3327\) : 1-12 【doi】 10.1007/s10578-023-01656-0.](#)
- ]

UNDER PEER REVIEW