

# Analysis of Professor Yang Jingfeng's Academic Experience in Treating Pediatric Multiple Tic Disorder

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**Abstract:** MTDs is characterized by involuntary facial and eyelid muscle twitches in children, often accompanied by emotional disturbances. In traditional Chinese medicine, this condition corresponds to syndromes such as *chi zong* (convulsions) and *chronic infantile convulsion*. Professor Yang Jingfeng holds that the internal cause of this disease lies in congenital deficiency of primordial essence, spleen deficiency and liver qi depression leading to insufficiency of nutrient-defense qi and exterior instability. The core pathogenesis is summarized as *taiyang meridian and yangming meridian invaded by pathogenic factors, which trigger liver wind*. Clinically, treatment first adopts the principle of “remove wind and relieve the exterior, calming wind and relieving spasms” After symptom relief, the therapeutic focus shifts to “tonify the spleen and kidney consolidating the root, and strengthen the body.” Professor Yang often employs modified *Gegen Tang* (*Radix Puerariae* decoction) combined with *Qianzheng San*, which has demonstrated remarkable clinical efficacy.

**Keywords:** MTDs, *Chi zong*, *Gegen Tang*, *Qianzheng San*, Clinical experience.

## 1. Introduction

MTDs is a neurodevelopmental disorder that begins in childhood, primarily characterized by involuntary motor tics and/or vocal tics, often accompanied by comorbidities such as attention deficit, hyperactivity, and obsessive behaviors [1]. Mild cases typically present with facial tics such as eye blinking, nose wrinkling, or brief shoulder shrugging, occurring infrequently with small amplitudes. Simple symptoms like throat clearing or sniffing may also be present. In severe cases, patients may exhibit loud shouting, barking-like sounds, or involuntary repetition of words. Approximately 12% of cases may involve coprolalia (involuntary utterance of obscene words) [2]. Both types of symptoms tend to worsen under emotional stress or fatigue. Due to overlapping clinical features, differential diagnosis must be made with conditions such as chorea, Wilson's disease, and myoclonic seizures in epilepsy [3].

MTDs is frequently co-occur with attention-deficit disorders, emotional disturbances, and learning difficulties. The incidence rate ranges from 0.5 to 1.0 per 100,000 people, with a male-to-female ratio of approximately 5:1 to 3:1. The average age of onset is around 7 years, with typical cases occurring between ages 2 and 15 [4]. The etiology of MTDs is complex, involving genetic predisposition [5], psychological stress, immune dysfunction, and pressures from family and social education. Its pathogenesis involves interactions among the nervous, immune, and endocrine systems, including mechanisms such as dopamine hyperfunction causing abnormal cortical excitability, bacterial infection-induced anti-neuronal antibodies mediating neuronal damage, and hormonal changes such as increased progesterone and decreased testosterone [6]. Commonly used Western medications include haloperidol, tiapride, and sulpiride [7]; however, long-term medication use and notable side effects often make sustained treatment difficult. In contrast, traditional Chinese medicine offers clear advantages in reducing drug dependence, minimizing adverse effects, and

improving overall constitution.

## 2. Academic Consensus

### 2.1 Disease Name

Classical TCM texts do not provide an explicit name for MTDs. It can be classified under *chi zong* (convulsions), *man jing feng*, *jing ti rou run* (involuntary muscular tremor), *liver wind pattern*, or *mu lian zha* (involuntary frequent eye blinking) [8].

### 2.2 Pathogenesis

The main causes of MTDs include three aspects:

1) Congenital factors: According to Tian Nian (On the Natural Life Span) in *Lingshu Jing* (*The Spiritual Pivot*), “With the mother as foundation and the father as shield” [9], parental deficiency of kidney essence and disharmony of *qi-blood* affect fetal constitution, predisposing to insufficiency and syndromes such as yin deficiency with wind movement or disharmony between heart and kidney. 2) Emotional factors: The text *Yu ying Jia Mi* (*The Secret of Nurturing Infants*) states that “the liver is often in excess, and the heart is often in excess” [10]. Modern children often face psychological stress; unresolved emotions may generate liver fire and stir internal wind, leading to muscular twitching. Excessive use of digital devices can exhaust the spirit mind, causing symptoms such as coprolalia and attention deficit. 3) Exogenous pathogens: Children's frail constitution makes them susceptible to invasion by six exogenous factors. Dysfunction of the lung's dispersing function may cause *qi* stagnation, generating heat and stirring up wind, or internal heat consuming yin-blood, leaving muscles malnourished and inducing tics.

Modern TCM clinicians classify common patterns into: Liver-kidney yin deficiency with internal wind pattern [8]: caused by congenital deficiency due to parental weakness,

resulting in insufficient nourishment of the liver; treatment principle is to tonify liver-kidney, nourish *yin*, and calm wind. Liver *qi* stagnation transforming into fire with liver-*yang* rising pattern [11]: caused by emotional disturbance consuming *yin* and leading to hyperactive *yang*; treatment principle is to soothe liver *qi*, clear heat, and calm wind. Exogenous wind invading and stirring internal wind pattern [8]: children with insufficient lung *qi* are prone to wind invasion, which may transform into heat and induce liver wind; treatment principle is to expel wind, clear heat, and calm internal wind.

### 3. Yang's Clinical Experience

Professor Yang Jingfeng, doctoral supervisor, has engaged in teaching and research of *Shanghan Lun* (Treatise on Cold Damage) and *Jin Gui Yao Lue* (*Synopsis of the Golden Chamber*) for over two decades, and is skilled in using classical formulas to treat metabolic and refractory diseases. He considers the fundamental cause of *MTDs* to be congenital deficiency of *Yuanzhen* (primordial essence), compounded by exogenous wind, which traverses the meridians and stirs up liver wind.

#### 3.1 Deficiency of Yuan Zhen

Bai Bing Shi Sheng chapter (*initiation of hundred diseases*) in *Lingshu Jing* states: "Wind, rain, cold, and heat cannot harm a person without deficiency" [9]. Children possess a "delicate *yin* and delicate *yang*" constitution—their organs and *qi* are not yet fully developed, and their nutritive and defensive *qi* are not robust, making them susceptible to wind pathogens. *Jin Kui Yao Lue* states: "When the vital energies of the five organs flow smoothly, one remains healthy and harmonious" [14]. If parents have constitutional deficiencies or if maternal care during pregnancy is inadequate, the child may inherit an insufficient *Yuanzhen*. Once fatigued, such children are easily affected by external pathogens.

Deficiency of *Yuanzhen* not only reduces resistance but also disrupts organ coordination. The liver governs free coursing and controls the tendons; when *Yuanzhen* is deficient, liver blood becomes insufficient, depriving tendons of nourishment and impairing flexibility. The spleen is the foundation of acquired constitution; deficiency of *Yuanzhen* weakens its transformation and transportation function, impairing the generation of *qi* and blood, thereby exacerbating organ malnutrition.

Moreover, children inherently have "abundant *yang* and insufficient *yin*"; deficiency of *Yuanzhen* easily leads to imbalance between *yin* and *yang*, with excessive liver *yang*, creating a predisposition for external wind to trigger internal wind. This congenital weakness forms both the internal basis for susceptibility to pathogens and the core internal factor in the development of *MTDs*, permeating all stages of the disease.

#### 3.2 Invasion of the Taiyang and Yangming Channels by Wind Pathogens

##### 3.2.1 Taiyang Channel Affected

The *qi* of *taiyang* meridian governs the exterior of the body. In children with insufficient healthy *qi* and weak exterior defense, wind pathogens first attack the *taiyang* level. The *taiyang* meridian "originates at the inner canthus of the eye, ascends to the forehead, and converges at the vertex" and "governs all *yang qi*" [9]. When wind pathogens invade the exterior, the *qi* of the *taiyang* meridian becomes impaired, blocking the collaterals and causing stagnation of *yang qi*. This stagnation transforms into heat and generates wind, resulting in involuntary twitching of facial muscles, possibly accompanied by low-grade fever, sore throat, cough, and other manifestations of lung-wei involvement. Some children exhibit frequent blinking or shoulder shrugging—symptoms consistent with the *taiyang* channel's pathway "entering the brain from the vertex, then exiting downward along the neck" and "running alongside the scapula." These manifestations align with the characteristics of impaired collateral circulation and tendon malnourishment.

##### 3.2.2 Yangming Channel Affected

The *yangming* meridian "follows the hairline, reaches the forehead, encircles the mouth, and surrounds the lips" [9], traversing the head and face, serving as the conduit for *qi* and blood to the facial muscles and tendons. Being rich in *qi* and blood, the *yangming* meridian relies on the spleen and stomach to transform food essences. However, children often have "spleen deficiency by nature"; indulgence in raw, cold, or greasy foods can injure the spleen and stomach, impairing the generation of *qi* and blood through the *yangming* meridian. Consequently, facial muscles and tendons become poorly nourished. When wind pathogens invade externally, they obstruct the flow of *qi* in the *yangming* meridian, causing stagnation and heat transformation, which generates wind. This manifests clinically as twitching at the corners of the mouth or limb movements.

#### 3.3 External Wind Penetrating Internally Along Meridians, Stirring Liver Wind

Wind pathogens do not merely affect the meridians—they can penetrate deeper into the viscera. *Jin Kui Yao Lue* notes: "When pathogens affect the meridians and enter the internal organs, it becomes an internally generated cause" [14]. Wind pathogens travel along meridians and invade the liver. *Jin Kui Yao Lue* records: "When wind affects the liver, there is twitching of the head and eyes, gait with curved posture, and a craving for sweet flavors" [14], describing symptoms such as involuntary head-eye movements, rib discomfort, and irritability—features shared with motor and emotional abnormalities seen in *MTDs*.

The liver governs free flow of *qi* and dislikes its stagnation. When wind invades the liver, the liver fails to regulate *qi* smoothly, leading to upward counter flow of liver *qi*, which in turn stirs internal wind, causing bodily tremors. Simultaneously, this counter flow of *qi* attacks and impairs the spleen and stomach, disrupting *middle-jiao qi* dynamics. Therefore, external wind penetrating inward along the meridians to stir liver wind constitutes a key pathogenic mechanism in *MTDs*.

## 4. Formula Analysis

### 4.1 Gegen Tang (Pueraria Decoction) – Formula Explanation

Based on the pathogenesis of “visceral deficiency, meridian invasion, and internal liver wind,” Professor Yang selects modified *Gegen Tang* combined with *Zhijing San* (Antispasmodic Powder). *Gegen Tang* originates from *Shanghan Lun*, Article 31: “For *taiyang* disease with stiff neck and back, absence of sweating, aversion to wind, *Gegen Tang* is indicated” [15]. It primarily treats stiff-type spasm due to cold-injury in the *taiyang* stage and with diarrhea associated with combined *taiyang-yangming* disease.

Children often develop symptoms following deficiency of healthy *qi* and exposure to wind-cold pathogens. These pathogens invade the *taiyang* and *yangming* meridians, restraining meridian *qi*, generating heat from stagnation, and producing wind, leading to muscle twitching in areas traversed by these two meridians—face and neck.

In *Gegen Tang*, *Guizhi* (*Cinnamomi Ramulus*) and *Mahuang* (*Ephedrae Herba*) are pungent and warm, dispersing wind-cold from the exterior. *Gegen* (*Puerariae Radix*) promotes fluid ascension and relaxes the tendons, guiding fluids upward to nourish the head and face, alleviating spasms. *Guizhi* and *Baishao* (*Paeoniae Radix Alba*) harmonize nutritive and defensive *qi*, warming and unblocking the meridians. Notably, *Guizhi* also soothes and regulates the liver, while *Baishao* nourishes yin and restrains liver hyperactivity, together regulating liver *qi*. *Shengjiang* (*Zingiberis Rhizoma Recens*), *Dazao* (*Jujubae Fructus*), and *Zhigancao* (*Glycyrrhizae Radix et Rhizoma*) strengthen the spleen and stomach, ensuring adequate production of *qi* and blood, restoring the functions of nutritive and defensive *qi*—such as “nourishing the four limbs,” “warming the flesh,” and “plumping the skin pores” [9].

### 4.2 Qianzheng San (Facial Paralysis Correcting Powder) – Formula Explanation

*Qianzheng San* was first recorded in *Gu Jin Yi Jian* (*Medical Insights from Ancient and Modern Times*) by Ming dynasty physician Qin Jingming. It consists of *Jiangcan* (*Bombyx Batryticatus*), *Quanxie* (*Buthus martensii Karsch*), and *Baifuzi* (*Typhonium giganteum Engl.*), mainly used for stroke with facial palsy [16].

Wu Hegao remarked: “...these three herbs treat internally generated wind and clear deficiency heat/phlegm. When guided by alcohol, they can enter the meridians and correct facial palsy” [17].

*Baifuzi* expels wind-phlegm, stops convulsions, detoxifies, resolves nodules, and relieves pain. It is acrid and warm, ascending to the head and face, particularly effective in the *yangming* meridian. *Quanxie* excels at calming wind and stopping spasms, unblocking collaterals, relieving pain, detoxifying, and resolving masses. *Jiangcan* calms wind and stops spasms, dispels wind, relieves pain, transforms phlegm, and resolves nodules [18].

*MTDs* fundamentally arises from spleen deficiency and liver stagnation, with superficial invasion by wind pathogens affecting the *taiyang* and *yangming* meridians. Children have weak digestive function; overconsumption of rich foods often generates phlegm-dampness. Prolonged liver stagnation may transform into fire and stir wind. Wind-phlegm ascending to the orifices commonly causes twitching of the nose and mouth, flickering eyelids. Phlegm traveling upward along the meridians to the throat may result in throat itching or globus hystericus; if phlegm transforms into fire and disturbs the mind, it may lead to irritability and inappropriate language.

In the formula, *Jiangcan* excels in resolving phlegm and unblocking collaterals; *Quanxie* specializes in calming wind and stopping spasms—one mild, the other potent—used together to enhance antispasmodic and phlegm-resolving effects. *Baifuzi* directs the action toward the head and face, enhancing the upward movement of the other two herbs, while simultaneously dispelling wind and resolving phlegm. This combination precisely addresses the pathogenesis of meridian obstruction and internal liver wind in *MTDs*.

### 4.3 Pharmacological Analysis

Research into the pathogenesis of *MTDs* suggests that key ingredients in *Gegen Tang* and *Zhijing San* may exert pharmacological effects on several mechanisms: (1) *Gegen* (*Pueraria*): Studies by Sun Zhigang et al. show elevated serum neuron-specific enolase (NSE) levels in children with *MTDs*, indicating neuronal injury, with NSE concentration positively correlating with symptom severity. *Puerarin* increases estrogen expression [19], offering protective effects on dopaminergic neurons. Additionally, it reduces cerebral ischemia-reperfusion injury and inhibits platelet aggregation [20]. (2) *Ephedra* (*Mahuang*): According to Swedo’s PANDAS hypothesis, exacerbation of tic symptoms is closely linked to streptococcal infection, which may reduce immune activity and indirectly alter neurotransmitter concentrations, triggering tics [6]. *Ephedra* aqueous and methanol extracts exhibit antioxidant, antibacterial, and anti-biofilm properties, showing antimicrobial activity against both Gram-positive and Gram-negative bacteria [21]. (3) *Cinnamon Twig* (*Guizhi*): Research by Kang et al. indicates that ethanol extracts of *Guizhi* downregulate Rho kinase signaling molecules, promoting vasodilation in peripheral and central vessels, improving circulation. *Guizhi* also exerts anti-anxiety and sedative effects on the central nervous system [22], potentially improving cerebral perfusion and alleviating anxiety and tension in tic patients. (4) *Baisha*: Imbalance of monoamine neurotransmitters is a major cause of *MTDs*. Wang Jingxia et al. found that *Baishao* extract increases serotonin (5-HT) levels, improving depressive behavior in rats [23]. Total glucosides of peony also reverse apoptosis induced by *Streptococcus pneumoniae* [24], reducing the risk of tic flare-ups triggered by bacterial infections. (5) *Quanxie*: Experimental studies show that scorpion venom inhibits calcium influx, reducing neuronal excitability and providing neuroprotection. It also promotes secretion of monoamine neurotransmitters in the mouse brain [25], helping reduce involuntary movements caused by disrupted motor signals. (6) *Silkworm Pupa* (*Jiangcan*): The PANDAS theory links *MTDs* to autoimmune reactions triggered by Group A beta-hemolytic *Streptococcus* (*GABHS*) infection. In vitro

studies indicate that beauvericin from *Bombyx batryticatus* acts on bacterial organelles (ribosomes or nuclei) and enzymes, exhibiting anti-Gram-positive activity [26]. Its effect specifically on GABHS requires further investigation.

## 5. Case Example

Patient: Male, 5.5 years old. Chief complaint: Involuntary eye blinking with hyperactivity for one year. One year ago, after a cold, the patient began experiencing involuntary eye blinking, progressing to head nodding in severe episodes. He is generally hyperactive with poor concentration. Occasionally emits unconscious strange sounds. Prone to recurrent flu infections. 14 days ago, after catching a cold, he experiences nasal congestion, runny nose, cough, and occasional mild asthma. Stool unformed, once a day; normal frequency of urination. Tongue: red with thin white coating. Pulse: *slippery*. Diagnosis: Wind-cold binding the exterior. Treatment principle: Dispel wind from the exterior, soothe liver, strengthen spleen, calm wind, stop spasms. Formula: Modified *Gegen Tang* combined with modified *Qianzheng San*. Prescription: Gegen (*Radix Puerariae Lobatae*) 10g, Sheng Mahuang (*Herba Ephedrae*) 3g, Guizhi (*Ramulus Cinnamomi*) 6g, Chao Baishao 10g, Shi Changpu (*Rhizoma Acori Tatarinowii*) 10g, Yuanzhi (*Radix Polygalae*) 8g, Tianma (*Rhizoma Gastrodiae*) 6g, Zhenzhumu (*Concha Haliotidis*) 15g, Quanxie 3g, Jiangcan (*Bombyx Batryticatus*) 5g, Xuanshen (*Radix Scrophulariae*) 10g, Fuling (*Poria*) 10g, Shanyao (*Rhizoma Dioscoreae*) 10g. 14 doses, one dose daily.

Second Consultation: Eye blinking improved. Still hyperactive. Nasal congestion reduced. Bowel movements remain unformed, once daily. normal frequency of urination. Appetite normal. No other obvious discomfort. Tongue: pale, thin white coating. Pulse: *slippery*. Prescription: Add Yizhiren (*Fructus Alpiniae Oxyphyllae*) 15g, Chao Baizhu 10g. Continue for 14 doses.

Third Consultation: Stool more formed. Eye blinking persists but upward rolling of the eyeballs has lessened. Unconscious strange sounds reduced. Still restless. Tongue: red, white coating. Pulse: *slowdown*. Prescription: Add Chantui (*Periostracum Cicadae*) 6g. 14 doses.

Fourth Consultation: Significant improvement in blinking. Hyperactivity and throat discomfort alleviated. Bowel and bladder functions normal. No other discomfort. Prescription: Add Shengdi (*Radix Rehmanniae Recens*) 10g, Xuanshen (*Radix Scrophulariae*) 10g. 14 doses.

This child presented with “involuntary eye blinking for one year, accompanied by head nodding, vocalizations, and hyperactivity,” meeting the diagnostic criteria for multiple *MTDs*—namely, persistent presence of both motor tics (blinking, nodding) and vocal tics (strange sounds) for over one year [21]. Given that tics worsen post-infection and are accompanied by nasal congestion, rhinorrhea, and cough, the pattern was identified as wind-cold binding the exterior. Additionally, loose stools, pale tongue, fine pulse, and frequent tics indicate spleen deficiency with liver hyperactivity and internal liver wind—consistent with the pathogenesis of “primordial essence deficiency with external

wind stirring internal wind.” Thus, the diagnosis was “wind-cold binding the exterior with internal liver wind.”

*Gegen Tang* was selected as the base formula because it releases the exterior, relaxes the muscles, and harmonizes nutritive and defensive *qi*. Gegen (*Radix Puerariae Lobatae*) ascends fluids and nourishes tendons, directing the formula to the *yangming* meridian. Guizhi (*Ramulus Cinnamomi*) warms and unblocks the *taiyang* meridian, addressing “impaired collaterals and wind obstruction.” Mahuang (*Herba Ephedrae*) dispels wind-cold and alleviates cough and wheezing. Due to internal heat and signs of *yin* deficiency, Chao Baishao was used in quantity to reflect the intent of Shaoyao Gancao Tang — to relieve spasm and nourish *yin*. Combined with *Qianzheng San*, it calms wind and stops spasms, removes stasis, and unblocks collaterals. Because the patient showed *yin* deficiency (red tongue, scant coating), Baifuzi was omitted to avoid its pungent and dry nature property damaging *yin*.

At initial consultation: Zhenzhumu (*Concha Haliotidis*) calms the spirit; Shichangpu (*Rhizoma Acori Tatarinowii*) and Yuanzhi (*Radix Polygalae*) open orifices and resolve phlegm; Tianma (*Rhizoma Gastrodiae*) pacifies liver wind and stops spasms. Second consultation: Added Yizhiren (*Fructus Alpiniae Oxyphyllae*) and Chao Baizhu (*Rhizoma Atractylodis Macrocephalae Praeparata*) to strengthen spleen and consolidate kidney, improving spleen deficiency and loose stools. Third consultation: Added Chantui (*Periostracum Cicadae*) to dispel wind and relieve spasm, especially for upward rolling of the eyes. Fourth consultation: With stabilized condition, treatment shifted to addressing the root cause—adding Shengdi (*Radix Rehmanniae Recens*) and Xuanshen (*Radix Scrophulariae*) to nourish kidney essence, enrich kidney water to support liver, and nourish *yin* to subdue wind.

The entire prescription centers on “treating both meridians and organs, liver and spleen together”—dispelling external wind, regulating nutritive and defensive *qi*, unblocking meridians, while simultaneously soothing the liver and stopping internal wind. The treatment balances exterior and interior, root and branch, cold and heat, reflecting the holistic advantage of TCM.

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