

# Therapeutic observation of Tui-pushing Wujing plus Chinese patent medicine for infantile diarrhea due to spleen deficiency

## 五经推治结合中药治疗儿童脾虚泻的疗效观察

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### Abstract

**Objective:** To observe the therapeutic efficacy of pediatric tuina plus Chinese patent medicine for preschool kids with diarrhea due to spleen deficiency.

**Methods:** Ninety-two eligible kids were divided into a tuina plus Chinese patent medicine and a Chinese patent medicine group by the random number table, with 46 cases in each group. The Chinese patent medicine group was intervened by oral administration of Qi Wei Bai Zhu San (Seven-ingredient *Atractylodes Macrocephala* Powder); the tuina plus Chinese patent medicine group was additionally given pediatric tuina therapy once a day, 20 min each time. Efficacy and safety were evaluated after 7-day treatment in both groups, and a 14-day follow-up was conducted.

**Results:** After treatment, the symptom scores all changed significantly in the two groups (all  $P < 0.05$ ). After intervention, the symptom scores in the tuina plus Chinese patent medicine group were significantly different from those in the Chinese patent medicine group (all  $P < 0.05$ ). The total effective rate was 78.3% in the Chinese patent medicine group, versus 89.1% in the tuina plus Chinese patent medicine group, and the between-group difference was statistically significant ( $P < 0.05$ ). Three cases got a relapse in the Chinese patent medicine group, versus one case in the tuina plus Chinese patent medicine group, and the between-group difference was statistically insignificant ( $P > 0.05$ ). The two groups each had one case of vomiting, which were treated properly and turned better. No other adverse reactions occurred.

**Conclusion:** Tuina plus Chinese patent medicine and Chinese patent medicine alone both are effective for diarrhea due to spleen deficiency in kids, but the combined therapy can produce more significant efficacy.

**Keywords:** Tuina; Massage; Pediatric Tuina; Spleen-qi Deficiency; Diarrhea; Child, Preschool

**【摘要】目的:** 观察小儿推拿结合中药治疗学龄前儿童脾虚腹泻的疗效。**方法:** 选择符合纳入标准的脾虚腹泻患儿92例, 根据随机数字表分为推拿加中药组和中药组, 每组46例。中药组采用口服七味白术散治疗; 推拿加中药组在服用相同中药的基础上加用小儿推拿治疗。小儿推拿每日1次, 每次20 min。两组均治疗7 d后进行疗效观察和安全性评价, 治疗14 d后随访复发情况。**结果:** 治疗后, 两组各类症状评分与同组治疗前均有统计学差异(均  $P < 0.05$ )。推拿加中药组治疗后各类症状评分与中药组比较均有统计学差异(均  $P < 0.05$ )。中药组总有效率78.3%, 推拿加中药组总有效率89.1%, 组间差异有统计学意义( $P < 0.05$ )。中药组复发3例, 推拿加中药组复发1例, 组间差异无统计学意义( $P > 0.05$ )。两组均有1例出现呕吐, 经处理后好转, 未出现其他明显不良反应。**结论:** 推拿加中药及单独中药治疗对儿童脾虚腹泻均有效, 推拿加中药治疗的疗效优于单独中药口服。

**【关键词】** 按摩; 推拿; 小儿推拿; 脾气虚; 腹泻; 儿童, 学龄前

**【中图分类号】** R244.1 **【文献标志码】** A

Xie Xie in traditional Chinese medicine (TCM) refers to diarrhea in modern medicine, a digestive disorder caused by various factors and manifested by altered stool form and increased frequency in bowel movements<sup>[1]</sup>. Kids between 6 months and 2 years old usually are at a high risk. Diarrhea due to spleen qi deficiency often occurs as a result of excessive intake of cold/cool-property medicine, improper, or overexertion. We used pediatric tuina plus Chinese patent medicine

to treat diarrhea due to spleen deficiency in kids since 2016. The report is given as follows.

## 1 Clinical Materials

### 1.1 Diagnostic criteria

It was made by referring to the criteria of diarrhea in *Pediatrics of Traditional Chinese Medicine*<sup>[2]</sup>. Had a history of taking unclean food or irregular milky diet, contracting wind-cold or seasonal diseases; more frequent bowel movements than usual, 3-5 times or even over 10 times a day; watery stools, pale yellow

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colored, or filthy and dark brown colored, with a small amount of mucus; coupled with nausea and vomiting, fever, abdominal pain, thirst, etc.; dehydration may be seen in severe cases (less urine, drowsy and low spirit, high fever, irritable and thirsty, or dry skin, sunken fontanel and eye sockets, and cry without tears), along with acid-base imbalance and electrolyte disorder (pinkish lips, abdominal bloating and pain, and long deep breaths); feces microscopic examination may find fat globules or a small amount of white and red blood cells; pathogenic examination of feces may show positive for bacterial cultivation, such as rotavirus and pathogenic *Escherichia coli*.

**1.2 Pattern differentiation criteria for diarrhea due to spleen deficiency in TCM**

By referring to the *Criteria of Diagnosis and Therapeutic Effects of Diseases and Syndromes in Traditional Chinese Medicine*<sup>[3]</sup>: persistent or recurrent diarrhea; loose or watery stools; milky residues or other undigested food found in stools; drowsy, poor appetite, and pale complexion; a pale tongue body covered by thin greasy coating, a weak pulse.

**1.3 Inclusion criteria**

Conforming the diagnostic criteria and the pattern differentiation criteria for spleen-deficiency diarrhea in TCM; age between 1 month and 3 years old, no gender preference; had not received any medication or other treatments specifically for diarrhea during the previous 2 weeks; free of tuina contraindications (such as unstable-stage malignant tumor, hemorrhagic diseases, extensive burns, contagious diseases, and fractures); without severe organic diseases; the guardians were informed of treatment protocol in this study and willing

to apply it to the kids, and signed informed consent form.

**1.4 Exclusion criteria**

Not in line with the above diagnostic and pattern differentiation criteria; age >3 years old; tuina contraindications; coupled with cardiovascular, liver, kidney or hematopoietic diseases; had received medications or other treatments for diarrhea during the previous 2 weeks; infectious diarrhea caused by bacillary dysentery, amoebic dysentery, or cholera; reluctant to receive the treatment protocol in this study.

**1.5 Statistical methods**

The SPSS version 22.0 was used for data processing. Measurement data, including age and post-treatment symptom scores, that met normal distribution and homogeneity of variance were analyzed by independent sample *t*-test, while rank sum test would be applied if normal distribution and homogeneity of variance were not met. Enumeration data were compared using Chi-square test. *P*<0.05 was taken to indicate statistical significance.

**1.6 General data**

Ninety-two eligible spleen-deficiency diarrhea patients who had been admitted to our hospital between January 2016 and December 2017 were recruited. They were divided into a tuina plus Chinese patent medicine group and a Chinese patent medicine group by the random number table method, with 46 cases in each group. There were no significant differences in gender, age and severity between the two groups (all *P*>0.05), indicating the comparability (Table 1).

**Table 1. Comparison of the general data**

Group	n	Gender (case)		Average age ( $\bar{x} \pm s$ , month)	Severity (case)	
		Male	Female		Mild	Moderate
Tuina plus Chinese patent medicine	46	24	22	14.5±7.2	42	4
Chinese patent medicine	46	26	20	17.4±8.8	43	3

**2 Treatment Methods**

**2.1 Chinese patent medicine group**

Kids in the Chinese patent medicine group were given oral administration of Qi Wei Bai Zhu San (Seven-ingredient *Atractylodes Macrocephala* Powder) for treatment.

Herbs: *Xi Yang Shen (Radix Panacis Quinquefolii)* 6 g, *Fu Ling (Poria)* 6 g, *Bai Zhu (Rhizoma Atractylodes Macrocephala)* 12 g, *Gan Cao (Radix Glycyrrhizae)* 3 g, *Huo Xiang (Herba Agastaches)* 12 g, *Mu Xiang (Radix Aucklandiae)* 6 g, and *Ge Gen (Radix Puerariae)* 15 g.

Preparation: One dose of the herbs was soaked in 800 mL water and placed over moderate heat until boiled, then simmered over low heat for 15 min until it

became 150 mL concentrated medicinal fluid. For kids <6 months, 10-40 mL per day; for kids between 6 months and 1 year old, 40-80 mL each day; for kids >1 year old, 80-120 mL per day. One dose of the decoction could be taken in by several times during a day.

While on the medication, the patients should have a light diet, taking digestible food, multiple meals but small servings.

The therapeutic efficacy was observed after 7 d.

**2.2 Tuina plus Chinese patent medicine group**

**2.2.1 Oral Chinese patent medicine**

Same Chinese patent medicine was offered to patients in this group, following the same dose and routine.

### 2.2.2 Pediatric tuina

Treatment principle: Reinforcing spleen qi and warming yang to stop diarrhea<sup>[4]</sup>.

Main manipulations: Tuina manipulations were applied to head and face regions for 1 min, including Kai-opening Tianmen (Figure 1), Tui-pushing Kangong (Figure 2), Rou-kneading Taiyang (EX-HN 5) (Figure 3), and Rou-kneading Erhougaogu (Figure 4), followed by Tui-pushing Wujing [including Bu-reinforcing Pijing 200 times (Figure 5), Qing-clearing Ganjing 200 times (Figure 6), Bu-reinforcing Xinjing 300 times (Figure 7), Qing-clearing Xinjing 200 times (Figure 8), Bu-reinforcing Feijing 200 times (Figure 9), and Bu-reinforcing Shenjing 200 times (Figure 10)].



Figure 1. Kai-opening Tianmen



Figure 2. Tui-pushing Kangong



Figure 3. Rou-kneading Taiyang (EX-HN 5)



Figure 4. Rou-kneading Erhougaogu



Figure 5. Bu-reinforcing Pijing



Figure 6. Qing-clearing Ganjing



Figure 7. Bu-reinforcing Xinjing



Figure 8. Qing-clearing Xinjing



Figure 11. Bu-reinforcing Dachang



Figure 9. Bu-reinforcing Feijing



Figure 12. Rou-kneading Wailaogong



Figure 10. Bu-reinforcing Shenjing



Figure 13. Rou-kneading Zhongwan (CV 12)

Assistant manipulations: Bu-reinforcing Dachang 100 times (Figure 11), Rou-kneading Wailaogong 100 times (Figure 12), Rou-kneading Zhongwan (CV 12) 300 times (Figure 13), Mo-rubbing abdomen for 1 min (Figure 14), Nie-pinching the spine 5 times (Figure 15), Rou-kneading Guiwei (Figure 16) and Tui-pushing Shangqijiegu (Figure 17) for 2 min, and Tui-pushing Feishu (BL 13) until the skin turned red (Figure 18), followed by Na-grasping Jianjing (GB 21), (Figure 19).

The tuina treatment was performed once a day, 20 min each time, for consecutive 7 d.



Figure 14. Mo-rubbing abdomen

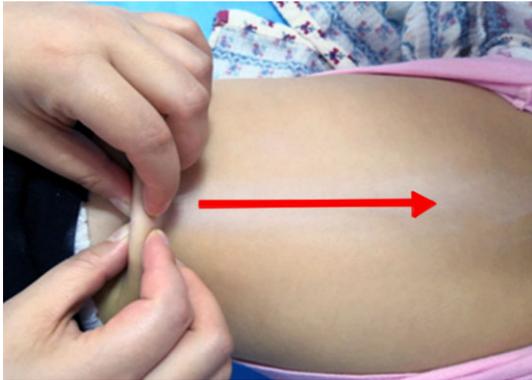


Figure 15. Nie-pinching the spine



Figure 19. Na-grasping Jianjing (GB 21)



Figure 16. Rou-kneading Guiwei



Figure 17. Tui-pushing Shangqijiegu



Figure 18. Tui-pushing Feishu (BL 13)

### 3 Observation of Therapeutic Efficacy

#### 3.1 Observation items

Efficacy observation and safety evaluation were performed after 7-day treatment for the two groups. Changes in the symptoms of spleen deficiency were observed based on the spleen deficiency symptoms scale (Table 2): normal, 0 point; mild, 2 points; moderate, 4 points; severe, 6 points. Of the relevant symptoms, appetite, stool pattern and complexion were observed independently. Recurrence was observed 14 d later.

#### 3.2 Evaluation criteria of therapeutic efficacy

Nimodipine method was adopted to calculate the reduction rate of the symptom score. The *Criteria of Diagnosis and Therapeutic Effects of Diseases and Syndromes in Traditional Chinese Medicine*<sup>[3]</sup> was referred to make the evaluation criteria of the therapeutic efficacy.

Reduction rate of the symptom score = (Pre-treatment symptom score – Post-treatment symptom score) ÷ Pre-treatment symptom score × 100%.

Clinical recovery: The symptoms and signs were gone or substantially gone; the reduction rate of the symptom score ≥95%.

Markedly effective: The symptoms and signs showed significant improvements; the reduction rate of the symptom score ≥70% but <95%.

Effective: The symptoms and signs were improved; the reduction rate of the symptom score ≥30% but <70%.

Invalid: The symptoms and signs were not obviously improved or even deteriorated; the reduction rate of the symptom score <30%.

#### 3.3 Results

##### 3.3.1 Comparison of the symptom scores

After treatment, the symptom scores changed significantly in both groups (all  $P < 0.05$ ), indicating that tuina plus Chinese patent medicine and Chinese patent medicine alone both were effective for infantile diarrhea due to spleen deficiency. The symptom scores in the tuina plus Chinese patent medicine group were

significantly different from those in the Chinese patent medicine group (all  $P<0.05$ ), suggesting that tuina plus

Chinese patent medicine produced more significant efficacy than Chinese patent medicine alone (Table 3).

**Table 2. Spleen deficiency symptoms scale**

Symptom	Normal (0 point)	Mild (2 points)	Moderate (4 points)	Severe (6 points)	
Stool	Irregular defecation (diarrhea or incomplete sensation of defecation)	No	Soft blobs, 2-3 times a day	Fluffy or mushy stools, 4-5 times a day, or watery stools, 1-2 times a day	Watery stools, 3 times a day or more
Appetite	Poor appetite	No	Loss of appetite but able to maintain the normal intake	Loss of appetite and food intake decreased by 1/3	Food intake decreased by over 2/3
	Stomach or abdominal discomfort	No	Abdominal bloating after having food, released on its own in 30 min	Abdominal bloating after having food, disappeared on its own in 2 h	Persistent abdominal bloating
Complexion	Incomplete eye closing during sleep	No	Occasional	Frequent	Persistent
	Pale or sallow complexion	No	Sallow and dull complexion	Sallow and dull complexion	Dry sallow and dull complexion
	Dark eye circles	No	Light dark and smaller than 1/3 of the lower lids	Dark circles occupied 1/3-2/3 of the lower lids	Deep black, occupied over 2/3 of the lower lids
Other symptoms of spleen deficiency	Emaciation	No	15%-25% lower than the normal weight	26%-40% lower than the normal weight	Lower than the normal weight by over 41%
	Drooling	No	Occasional	Frequent	Persistent
	Low spirit and restless	No	Mild	Obvious	Severe
	Spontaneous sweating and hyperhidrosis	No	More sweat than usual but disappeared instantly, clothes not wet	Sweating in head and neck regions, underwear wet	Dripping with sweat, clothes thoroughly wet
	Drowsy and lack of strength	No	Slightly drowsy	Significantly drowsy	Weakness in four limbs

**Table 3. Comparison of the symptom scores**

Item	Tuina plus Chinese patent medicine group (n=46)		Chinese patent medicine group (n=46)	
	Pre-treatment	Post-treatment	Pre-treatment	Post-treatment
Other symptoms of spleen deficiency	16.97±3.63	3.04±2.25 <sup>1)2)</sup>	16.23±3.19	4.20±1.78 <sup>1)</sup>
Appetite	4.42±1.46	1.52±1.41 <sup>1)2)</sup>	4.56±1.45	2.39±1.17 <sup>1)</sup>
Stool	4.73±1.22	1.73±1.31 <sup>1)2)</sup>	4.42±1.40	2.39±1.24 <sup>1)</sup>
Complexion	8.50±2.37	2.57±1.71 <sup>1)2)</sup>	8.09±2.49	4.43±1.50 <sup>1)</sup>

Note: Intra-group comparison, 1)  $P<0.05$ ; compared with the Chinese medication group, 2)  $P<0.05$

### 3.3.2 Comparison of the clinical efficacy

After 7-day treatment, the total effective rate was 78.3% in the Chinese patent medicine group, versus 89.1% in the tuina plus Chinese patent medicine group, and the between-group difference was statistically significant ( $P<0.05$ ), indicating that the tuina plus Chinese patent medicine group produced more significant efficacy than the Chinese patent medicine group (Table 4).

### 3.3.3 Comparisons of the adverse reactions and recurrence

At the follow-up 14 d later, 1 case got relapse and the

recurrence rate was 5.0% (1/20) in the tuina plus Chinese patent medicine group; 3 cases got relapse in the Chinese patent medicine group and the recurrence rate was 18.8% (3/16). There was a significant difference in the recurrence rate between the two groups ( $P<0.05$ ), indicating that the tuina plus Chinese patent medicine group had a lower relapse rate.

The two groups had 1 case of vomiting each which turned well after corresponding treatment, and there was no significant difference in the occurrence rate of adverse reactions between the two groups ( $P>0.05$ ), (Table 5).

**Table 4. Comparison of the clinical efficacy**

Group	n	Clinical recovery	Markedly effective	Effective	Failureid	Total effective rate (%)
Tuina plus Chinese patent medicine	46	20	12	9	5	89.1 <sup>1)</sup>
Chinese patent medicine	46	16	13	7	10	78.3

Note: Compared with the Chinese patent medicine group, 1)  $P < 0.05$

**Table 5. Comparison of the adverse reactions**

Group	n	Nausea	Vomiting	Skin allergy	Other discomforts	Occurrence rate of adverse reactions (%)
Tuina plus Chinese patent medicine	46	0	1	0	0	2.2
Chinese patent medicine	46	0	1	0	0	2.2

## 4 Discussion

Diarrhea is commonly encountered in pediatrics and can happen in various digestive diseases. It is usually related to the following factors: digestive dysfunction due to an immature digestive system in infants; the rapid development requires more nutrients, which causes a heavy digestion and absorption load to gastrointestinal system; a poor defense function of the body and intestinal flora imbalance<sup>[5-6]</sup>. Besides, compared with breast-feeding, artificial feeding may increase the odds of intestinal infection due to the lack of many humoral factors.

Ancient TCM records have offered plenty of elaborations on the pathogenesis and etiology of infantile diarrhea, holding that it should be the dysfunctions of the spleen and stomach to blame. According to some physicians, infantile diarrhea is mainly caused by dampness, especially in summer and autumn, and kids under 2 years old run a higher risk<sup>[7]</sup>. The clear yang energy fails to rise when spleen and stomach are too weak to transport and transform food, thus presenting loose stools. Symptoms of spleen deficiency such as sallow complexion will present if the spleen is not working well and providing enough nutrition. Xu L, *et al*<sup>[8]</sup> brought up that spleen-deficiency diarrhea can be treated by targeting the lung. Wang JA, *et al*<sup>[9]</sup> held that diarrhea is located at the spleen; vomiting is located at the stomach; though rarely seen, fear-induced diarrhea is associated with the liver; chronic diarrhea is related to the kidney.

Guided by TCM theories, pediatric tuina applies a variety of manipulations to specific points in order to treat and prevent diseases<sup>[4,10]</sup>. Tui-pushing Wujing was adopted as the major manipulation in this study. This manipulation is a typical one of Xiangxi (the western part of Hunan Province) Liu's infantile tuina school<sup>[11]</sup>, whose most important theory is Tui-pushing Jing to treat diseases of Zang-fu organs. Guided by the theory of visceral manifestations and five elements, Tui-pushing Wujing manipulation treats diseases on a general scale by following the indications of Wujing and their interactions between each other. It uses hand

instead of medication to regulate the Zang-fu functions based on pattern differentiation and finally achieve the efficacy<sup>[12]</sup>.

The four major manipulations for head and face region are to open orifices<sup>[13]</sup>. Tui-pushing Pijing intensively plus Rou-kneading Zhongwan (CV 12) (reinforcing the middle Jiao) works for supplementing spleen qi to help digestion. Qing-clearing Ganjing is to prevent from hyperactive liver qi interfering with the spleen function. Bu-reinforcing Feijing, Shenjing and Xinjing can warm the yang to assist the spleen. Qing-clearing Xinjing is applied afterwards to calm the heart fire. Mo-rubbing abdomen, Nie-pinching the spine and Rou-kneading Wailaogong can reinforce the yang and the middle Jiao. Bu-reinforcing Dachang, Rou-kneading Guiwei and Tui-pushing Shangqijiegu are essential manipulations for diarrhea and can improve the intestinal function and help with defecation. Tui-pushing Feishu (BL 13) till the skin turns red as it can promote the activity of lung qi and assist the spleen to stop diarrhea. Na-grasping Jianjing (GB 21) is to close the orifice<sup>[14]</sup>.

Spleen-deficiency diarrhea can be treated with Bai Zhu San (*Atractylodes Macrocephala* Powder), which was established by Qian Yi (a famous pediatrician in Song Dynasty), to tonify and nourish spleen yin<sup>[15]</sup>. As a prescription for diarrhea due to spleen deficiency in kids, Bai Zhu San (*Atractylodes Macrocephala* Powder) is based on Si Jun Zi Tang (Four Noble Ingredients Decoction). Among its ingredients, *Ren Shen* (*Radix Ginseng*), *Bai Zhu* (*Rhizoma Atractylodes Macrocephala*), *Fu Ling* (*Poria*) and *Gan Cao* (*Radix Glycyrrhizae*) can tonify qi and reinforce the spleen function; *Mu Xiang* (*Radix Aucklandiae*) and *Huo Xiang* (*Herba Agastaches*) are fragrant and can activate the spleen to resolve dampness and unblock stagnation; *Ge Gen* (*Radix Puerariae*) works to boost stomach qi to cease diarrhea and ascend the clear qi. Considering the fluid deprivation resulting from long-term diarrhea, *Xi Yang Shen* (*Radix Panacis Quinquefolii*) was used for replacing *Ren Shen* (*Radix Ginseng*) in this study, for tonifying yin qi, supplementing fluid and quenching thirst. The combination of these herbs can reinforce spleen qi,

supplement fluid and clear dampness to stop diarrhea. Here in this prescription, the dose of *Ge Gen (Radix Puerariae)* was doubled to ascend stomach qi and bring up the fluid. The decoction was made to take as tea to supplement the fluid in stomach, so that diarrhea and thirst would disappear. According to our clinical experience, the medicinal decoction cannot be well absorbed and digested because of the impaired function of large intestine. Therefore, tuina manipulations were used to help regulate the intestinal function and qi activity, thus ceasing diarrhea and controlling the development of the disease more rapidly<sup>[16]</sup>.

Besides, spleen-deficiency diarrhea is very common in kids. Proper nursing care should be provided during the whole treatment process. First, breast-feeding is recommended, with gradual adding of dietary supplement, to maintain a balanced diet. Second, a good sanitary habit should be built up, such as regularly sterilizing the milk bottle and staying away from raw cold food and food difficult to digest. Third, misuse of medications such as antibiotics needs to be prohibited. Fourth, kids are suggested to do some outdoor exercises for improving disease resistance. Fifth, properly use the nursing care based on both Chinese and Western medicine to encourage the recovery<sup>[17]</sup>.

This study indicated that tuina plus Chinese patent medicine can rapidly mitigate symptoms and signs of infants with diarrhea due to spleen deficiency, while its efficacy was more remarkable than that of Chinese patent medicine alone. Therefore, pediatric tuina plus oral administration of Chinese patent medicine, along with proper nursing care, can improve the state of spleen deficiency and the absorption ability of small intestine, so as to enhance the clinical efficacy<sup>[18-20]</sup>.

#### Conflict of Interest

The author declared that there was no potential conflict of interest in this article.

#### Statement of Informed Consent

Informed consent was obtained from the guardians of the recruited children in this study.

Received: 9 November 2018/Accepted: 12 December 2018

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