

Efficacy observation on pediatric tuina plus Chinese medicine for exogenous fever in children

小儿推拿配合中药治疗儿童外感发热疗效观察

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Abstract

Objective: To observe the clinical effects of pediatric tuina plus Chinese medicine for exogenous fever in children.

Methods: A total of 150 children with exogenous fever were randomly divided based on the random digital table into a control group (75 cases) and a treatment group (75 cases). The control group was treated with oral Xiao'er Chaigui Tuire Keli (<1 year old, 0.5 bag/time; 1-3 years old, 1 bag/time; 4-6 years old, 1.5 bags/time), 4 times/day. The treatment group was treated with pediatric tuina plus the intervention of the control group. The amount and usage of Chinese medicine were the same as those of the control group; tuina was conducted 1 time/day. The clinical effects and adverse reactions were observed after 3 d of treatment in both groups. The recurrence was observed within 7 d after the end of treatment.

Results: The total effective rate was 92.0% in the treatment group and 81.3% in the control group. The difference between the two groups was statistically significant ($P < 0.05$). There were no obvious adverse reactions in the two groups after treatment. The recurrence rate was 1.5% in the treatment group and 13.1% in the control group. The difference in the recurrence rate between the two groups was statistically significant ($P < 0.05$).

Conclusion: Pediatric tuina plus Chinese medicine is effective in treating children with exogenous fever.

Keywords: Tuina; Massage; Pediatric Tuina; Chiropractics (Traditional Chinese Medicine); Traditional Chinese Drugs; Fever; Exogenous Diseases; Child, Preschool

【摘要】目的: 观察小儿推拿结合中药治疗儿童外感发热的临床疗效。**方法:** 将150例外感发热患儿按随机数字表法分为对照组和治疗组, 每组75例。对照组采用口服小儿柴桂退热颗粒治疗(1岁以内, 0.5袋/次; 1-3岁, 1袋/次; 4-6岁, 1.5袋/次), 4次/日。治疗组在对照组用药基础上加用小兒推拿治疗。中药用量、用法同对照组; 推拿1次/日。两组均治疗3 d后进行疗效判定及不良反应情况观察, 治疗结束后7 d内观察复发情况。**结果:** 治疗组总有效率为92.0%, 对照组总有效率为81.3%, 组间差异有统计学意义($P < 0.05$)。治疗后两组均未出现明显的不良反应。治疗组复发率1.5%, 对照组复发率13.1%, 两组复发率差异有统计学意义($P < 0.05$)。**结论:** 小儿推拿结合中药治疗儿童外感发热疗效确切。

【关键词】 推拿; 按摩; 小儿推拿; 捏脊; 中药; 发热; 外感病证; 儿童, 学龄前

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Fever refers to axillary temperature (test for 10 min) exceeding 37.3 °C, which is one of the most common clinical symptoms in pediatrics. Chinese medicine believes that more than 90% of fever in children is caused by exogenous factors. The quality of children's body is pure yang, which makes it easy for the exogenous pathogenic factors to transform into heat. Persistent high fever can easily cause convulsions, which have a serious impact on the growth and development of children. Western medicine has a rapid fever-reducing effect but may cause adverse reactions. Long-term use of Western medicine may harm the body. Although traditional Chinese decoction is effective

in treating children with fever, it has a bad taste and is difficult for children to accept. Pediatric tuina is safe and effective, with few adverse reactions and good compliance, and is often used in the treatment of pediatric conditions^[1-3]. This study investigated the clinical effects of tuina plus Chinese medicine in treating exogenous fever in children. The report is as follows.

1 Clinical Materials

1.1 Diagnostic criteria of fever

In accordance with the diagnostic criteria for fever stipulated in the *Pediatric Massage*^[4]: the axillary temperature exceeds the normal standard (the temperature is 37.5-38.0 °C for low fever; 38.1-39.0 °C for moderate fever; 39.1-40.0 °C for high fever; 40 °C

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for ultra-high fever); or the body temperature is normal, but with subjective sense of local or body burning, or the doctor feels fever on the body surface or detects dysphoria in chest, palms and soles, facial flushing; blood routine detection shows rise in the total number of white blood cells (WBC) and neutrophils, or pathogens are found in the blood culture.

1.2 Diagnostic criteria of exogenous fever in Chinese medicine^[5]

Clinical manifestations: Aversion to cold and fever, head and body discomfort, discomfort in the throat, cough, runny nose and sneezing.

Signs: A tongue with thin coating, floating pulse and visible veins in the index finger.

History: Most of the cases have a history of external contraction.

Syndrome differentiation: Exogenous wind cold shows aversion to cold, high fever, head and body pain, no sweat, dizziness and floating and tight pulse; exogenous wind heat presents with slight aversion to cold, or aversion to wind, fever, sweating, sore throat, thirsty, red tongue, floating and rapid pulse.

1.3 Inclusion criteria

In conformity with the above diagnostic criteria; aged 6 months to 8 years old, gender not limited; those who could actively cooperate to complete clinical observation.

1.4 Exclusion criteria

Those who had contraindications to tuina; those with primary diseases involving cardiovascular, liver, kidney or hematopoietic system; children with mental illness; those who received drugs or other treatments for exogenous fever within the past 5 d; those with obvious serious infectious diseases; those who did not want to receive the treatment.

1.5 Rejection, shedding and suspension criteria

Cases that were not in compliance with the inclusion criteria; failed to follow the doctor's advice, resulting in

incomplete information and affecting the efficacy assessment; self-exit in the course of the study; serious adverse reactions or adverse events that made it impossible to continue clinical observation; unable to adhere to the test. Those who did not finish the 1/2 course before withdrawal were considered as shedding, and those who fell off due to ineffective treatment or finished more than 1/2 course of treatment were included in the efficacy analysis.

1.6 Statistical methods

The SPSS 17.0 version statistical software was used for statistical analysis and management. The measurement data were described as mean \pm standard deviation ($\bar{x} \pm s$) and processed by *t*-test; the counting data were expressed as rate (%) and processed by Chi-square test. $P < 0.05$ was used to indicate statistical significance in the difference.

1.7 General data

In this study, a total of 150 children with exogenous fever were recruited. The cases were outpatients recruited from Ningbo Yinzhou People's Hospital, Zhejiang Province between June 2016 and December 2017. The children were divided randomly by the digital table into a treatment group and a control group, with 75 cases in each group. In the observation group, the age ranged from 6 months to 8 years old, the duration ranged from 6 h to 48 h and the body temperature ranged from 38.2 °C to 39.8 °C. In the control group, the age ranged from 6 months to 7 years old, the duration ranged from 5 h to 48 h and the body temperature ranged from 38.3 °C to 39.7 °C. There was no significant disease history in the two groups. The gender, age, disease duration and body temperature of the two groups were statistically processed. The between-group differences were not statistically significant (all $P > 0.05$), indicating that the two groups were comparable (Table 1).

Table 1. Comparison of general data between the two groups

Group	<i>n</i>	Gender (case)		Average age ($\bar{x} \pm s$, year)	Mean course ($\bar{x} \pm s$, year)	Mean body temperature ($\bar{x} \pm s$, °C)
		Male	Female			
Treatment	75	45	30	3.7 \pm 1.5	12.5 \pm 11.8	38.6 \pm 0.4
Control	75	37	38	3.5 \pm 1.6	12.6 \pm 11.8	38.5 \pm 0.6

2 Therapeutic Methods

2.1 Control group

In the control group, children were treated with Xiao'er Chaigui Tuire Keli [approval number of State Food and Drug Administration: z20050716, manufactured by Sunflower Pharmaceutical Group (Xiangyang) Longzhong Co., Ltd.]

The main ingredients: *Chai Hu* (*Radix Bupleuri*), *Gui Zhi* (*Ramulus Cinnamomi*), *Ge Gen* (*Radix Puerariae*), *Fu*

Ping (*Herba Spirodela*), *Huang Qin* (*Radix Scutellariae*), *Bai Shao* (*Radix Paeoniae Alb*) and *Chan Tui* (*Periostracum Cicadae*).

Dosage: Below 1 year old, 0.5 bag/time; 1-3 years old, 1 bag/time; 4-6 years old, 1.5 bags/time. Four times a day, 3 d for a course of treatment.

2.2 Treatment group

2.2.1 Chinese medicine treatment

The children in the treatment group received the same medicine as those in the control group, and the

drug dose and administration method were the same as those in the control group.

2.2.2 Tuina treatment

To Qing-clear Feijing and Ping-soothe Ganjing for 2 min: the doctor used the index finger directly to push the child's index finger and ring finger from the root to the fingertip (Figure 1).



Figure 1. Qing-clearing Feijing and Ping-soothing Ganjing

To Qing-clear Tianheshui (Figure 2) and Da Ma Guo Tianhe (Tui-pushing Tianheshui Like Horse Jump) (Figure 3) for 5 min: the doctor used the thumb to press on Neilaogong, pushing from the child's wrist transverse crease to the elbow transverse crease by the two fingers of the other hand for several times; four fingers closed together and patted the Tianheshui from the bottom up, until the local skin turned flushing red.

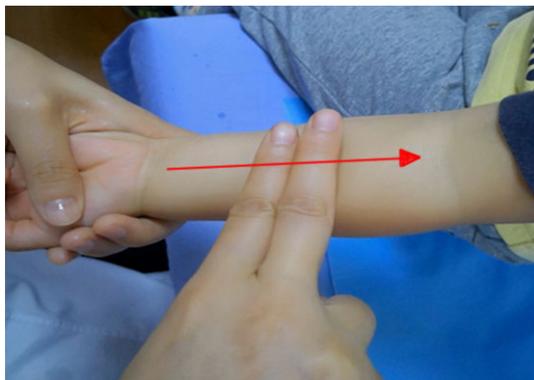


Figure 2. Qing-clearing Tianheshui

To Tui-push down along Tianzhugu (cervical vertebrae) for 2 min: The doctor used two fingers together to push down from the middle of the posterior hairline to Dazhui (GV 14), until the local skin area flushed (Figure 4).

To Mo-rub Yongquan (KI 1) for 3 min: The thumb was used to Mo-rub Yongquan (KI 1) of the child (the depression at the junction of the first 1/3 and the middle 1/3 of the foot), (Figure 5).



Figure 3. Da Ma Guo Tianhe (Tui-pushing Tianheshui Like Horse Jump)



Figure 4. Tui-pushing down along Tianzhugu (cervical vertebrae)



Figure 5. Mo-rubbing Yongquan (KI 1)

To Nie-pinch the spine to release Sha-petechia for 3 min: To conduct Nie-pinching the skin on the back along the Governor Vessel and the first lateral line of the Bladder Meridian to release Sha-petechia for 3 min, that is, the doctor placed both hands by the two sides of the spine with the thumbs close to it, pushing from the bottom up and pinching the skin around the spine by the index and middle fingers. It was repeated for 3-5 times. To release Sha-petechia out, the doctor placed the thumbs and forefingers symmetrically around the acupoints, and forcefully pushed towards

the middle part to make a '+' mark (Figure 6 and Figure 7). Nie-pinched the spine to release Sha-petechia from Guiwei (the end of the tailbone) to Dazhui (GV 14) to make obvious blush on the back.

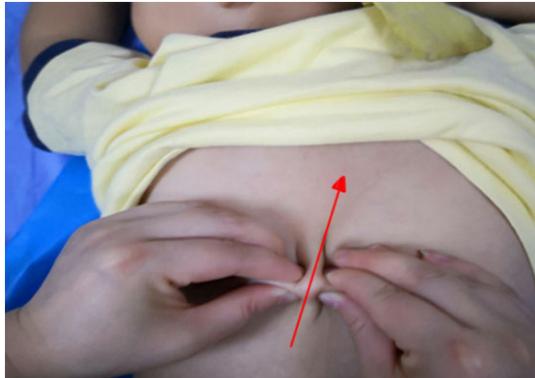


Figure 6. Nie-pinching the spine to release Sha-petechia



Figure 7. Sha-petechia on the back

The 75% alcohol diluted with water was used as a medium to conduct tuina therapy for 15 min each time, once a day, for a total of 3 d.

3 Therapeutic Efficacy Observation

The therapeutic efficacy was observed after 3 d of treatment, and the adverse reactions were recorded. The recurrence was observed within 7 d after the end of treatment.

3.1 Criteria of therapeutic efficacy

The criteria of therapeutic efficacy were formulated in accordance with the *Criteria of Diagnosis and Therapeutic Effects of Diseases and Syndromes in Traditional Chinese Medicine*^[5].

Cured: The clinical symptoms disappeared within 24 h after treatment, and the body temperature returned to normal with no recurrence.

Marked effect: The clinical symptoms disappeared within 24-48 h after treatment, and the body temperature returned to normal.

Effective: The clinical symptoms were relieved within 49-72 h after treatment, and the body temperature returned to normal.

Invalid: Till 72 h after treatment, there was no change in body temperature, or even became worse.

3.2 Results

3.2.1 Comparison of clinical effects

After 3 d of treatment, the total effective rate was 92.0% in the treatment group and 81.3% in the control group. The difference in the total effective rate between the two groups was statistically significant ($P < 0.05$), indicating that the overall efficacy of the treatment group was better than that of the control group (Table 2).

3.2.2 Comparison of safety between the two groups

Two patients in each group experienced mild adverse reactions. There was no significant difference in the incidence of adverse reactions between the two groups ($P > 0.05$). Nausea was treated with warm water and pain was helped with massage, and the adverse reactions were all alleviated. It indicated that both treatments were safe (Table 3).

3.2.3 Comparison of recurrence

Seven days after treatment, the patients were followed up by telephone. The recurrence rate was 1.5% (1 case) in the treatment group and 13.1% (8 cases) in the control group. The difference in the recurrence rate between the two groups was statistically significant ($P < 0.05$). The recurrence rate of the treatment group was significantly lower than that of the control group (Table 4).

Table 2. Comparison of clinical efficacy between the two groups (case)

Group	n	Cured	Marked effect	Effective	Invalid	Total effective rate (%)
Treatment	75	35	22	12	6	92.0 ¹⁾
Control	75	29	17	15	14	81.3

Note: Compared with the control group, 1) $P < 0.05$

Table 3. Comparison of safety between the two groups (case)

Group	n	Nausea	Skin allergies	Pain	Other discomforts	Adverse reaction rate (%)
Treatment	75	1	0	1	0	2.7
Control	75	2	0	0	0	2.7

Table 4. Comparison of recurrence between the two groups

Group	n	Number of relapses (case)	Recurrence rate (%)
Treatment	69	1	1.5 ¹⁾
Control	61	8	13.1

Note: Compared with the control group, 1) $P < 0.05$

4 Discussion

Children have delicate organs, and immature defense function, so that they can't adapt to the environment and climate change. In addition, improper care makes it easy for the wind cold or heat to attack the body, which obstructs defense yang qi and induces fever^[6]. High fever can sometimes lead to convulsions that can seriously affect a child's health^[7].

Clinical treatment of exogenous fever in children mainly includes rest, symptomatic treatment and prevention of complications. At present, Western medicine often uses antipyretics such as acetaminophen, ibuprofen and compound aspirin. Ibuprofen is the only antipyretic recommended by the World Health Organization (WHO) and the Food and Drug Administration (FDA) for children. It has been widely used clinically, but most of the Western medicines have unforeseen adverse reactions.

As a traditional Chinese medicine treatment, pediatric tuina is more and more popular among parents. It is a health care method to apply the basic theory of traditional Chinese medicine to act on specific acupoints of children's body to enhance the physical fitness of infants and young children^[8-9]. Pediatric tuina has the functions of regulating yin and yang, strengthening the healthy qi and eliminating evil qi, and dredging meridians. As a method of external therapy of traditional Chinese medicine, it has been widely used in the treatment of common diseases in children^[8-9]. Clearing the heat and dispersing the external evil is the main rule for treating children with exogenous fever. To Qing-clear Tianheshui and Feijing and Ping-soothe Ganjing are the core methods for treating pediatric exogenous fever^[10].

The most sensitive body part of children for pediatric tuina is the hand, where can be stimulated to adjust the function of Zang-fu organs^[11]. Qing-clearing Feijing can not only dispel the evil and strengthen the Wei-defensive qi, but also disperse the heat through the exterior layer of body; Ping-soothing Ganjing can clear the heat, remove the annoyance and arrest convulsion. Qing-clearing Feijing and Ping-soothing Ganjing can be adopted in treating fever caused by either external or internal evils. The manipulation of Qing-clearing Tianheshui is of cooling effect, which is the typical feature of clearing method^[12]. It can not only clear the inner heat of the heart, but also disperse the heat to the exterior, so that it can be used together with the

manipulation of Da Ma Guo Tianhe (Tui-pushing Tianheshui Like Horse Jump) to strengthen the antipyretic effect. Tianzhugu can be used to clear or descend to control the fire of the body; Yongquan (KI 1) ignites and leads the fire to its original place to protect the yin liquid. Nie-pinching the spine can stimulate the acupoints on the Governor Vessel and the Bladder Meridian to regulate Zang-fu organs, clear the dampness, enhance the immunity, and adjust the psychological status^[13-15]. From the view of modern medicine, the spine is the main skeleton of the body. A large number of autonomic ganglia and nerve trunks are distributed on both sides of the spine, acting in a bi-directional manner, excitation or inhibition under physiological or pathological conditions. Therefore, Nie-pinching the spine can directly stimulate the nerve roots, affect the blood circulation of the back and the body temperature regulation center, thereby treat exogenous fever^[16-17]. Releasing Sha-petechia by Nie-pinching the spine has strong force to clear the heat and acquire a quick recovery. The manipulations mentioned above can be used together to clear the heat and fire, nourish yin and save liquid, and produce significant efficacy for exogenous fever^[18-19]. To treatment fever, the medium of manipulations is very important. Generally, cold water or 75% alcohol diluted with water is chosen. The manipulation should be strong and fast. After tuina treatment, warm water, good care, avoidance of wind evil, balanced nutrition and regular lifestyle are advised^[20].

The main components of Xiao'er Chaigui Tuire Keli have the function to induce sweating and release the exterior, clear the interior and alleviate the heat. The combination of various Chinese drugs in Xiao'er Chaigui Tuire Keli can take both exterior and interior parts into account to harmonize Shaoyang Meridian to clear the heat.

The results of this study showed that after 3 d of treatment, the total effective rate of the treatment group was higher than that of the control group, and the recurrence rate was lower than that of the control group, indicating that the efficacy of pediatric tuina plus Xiao'er Chaigui Tuire Keli in treating exogenous fever be better than oral administration of Xiao'er Chaigui Tuire Keli alone. Moreover, the tuina manipulations are easy to operate, and thus this therapy is suitable for community promotion.

Conflict of Interest

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.

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