

# Research on curative effect of traditional Chinese medicine treating low-grade fever of children caused by respiratory system infection

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**Abstract:** This study aims to explore the curative effect of traditional Chinese medicine treating low-grade fever of children caused by respiratory system infection. Sixty children who suffered low-grade fever caused by respiratory system infection were selected and divided into treatment group and control group randomly, each with 30 cases. Control group was treated with conventional methods including oxygen uptake, nebulization and anti-infection, etc, while treatment group was given boil-free granules of traditional Chinese medicine besides the treatment which control group received. Then clinical curative effect of two groups was compared. Results showed that 28 cases (93.3%) were cured in treatment group; while 21 cases (70.0%) were cured in control group. Compared with control group, the treatment group showed up better treatment efficiency and the difference between groups was of statistical significance ( $P < 0.05$ ). Comparison of results of two groups suggested that, traditional Chinese medicine granules has satisfactory curative effect in the treatment of low-grade fever of children caused by respiratory system infection; characterized by short treatment cycle and effective treatment effect, Chinese medicine granules in the combination with oxygen atomization inhalation is proved to be able to efficiently remit symptoms such as coughing, gasp and labored breathing, with outstanding curative effect in the treatment of low-grade fever of children caused by respiratory system infection, thus it is worthy of popularization and application clinically.

**Keywords:** Traditional Chinese medicine; children; respiratory system infection; long-term low-grade fever.

## INTRODUCTION

Children repeated respiratory infection with an incidence rate of 20% is a commonly seen disease during childhood. Its cause is that children are more likely invaded by virus and bacteria due to their young age, immature development of body and incomplete immune system. Clinically, repeated infection of children respiratory system was normally treated using antibacterial agents and phlegm reduction, etc. But due to the diversity of symptoms and repetition, the curative effect is not satisfactory (Jin, 2011), which brings pain to many children and severely impact their living quality. In most cases, clinical treatments of children respiratory infection use lots of antibiotics, antivirus and anti-inflammation therapy, but it can lead to long term fever and drug resistance (Weize, 2013; Fang, 2012). According to the status analysis of application of antibiotics in the treatment of children respiratory system infection made by domestic scholars, untoward effects bring unnecessary harm to children and whether antibiotics should be used in treating accurate respiratory infection should be considered (Huajun and Lihua, 2013). Generally speaking, the treatment principle of upper respiratory infection is rest, symptomatic treatment and home nursing. Antibiotics should not be used unless there is distinct bacterial infection such as suppurative tonsillitis and otitis media suppurative, etc. According to traditional Chinese medicine theory and the pathological

characteristics of children respiratory infection, the treatment applying traditional Chinese medicine can avoid the malady brought by anti-bacteria and antivirus agents; and several kinds of drug matching of traditional Chinese medicine are remarkable antibacterial and antivirus effect as well as comprehensive treatment effect such as antipyretic, sedation, reduce phlegm and improving local blood circulation. In order to further observe the curative effect of traditional Chinese medicine treating low-grade fever of children caused by respiratory system infection, this study treated children who suffered low-grade fever caused by respiratory system infection with traditional Chinese medicine and achieved effective clinical effect.

## MATERIALS AND METHODS

### *General materials*

Sixty children who suffered long-term low-grade fever caused by respiratory system infection and who were admitted into the Affiliated Hospital of Beihua University from March 2011 to March 2014 were selected and divided into control group and treatment group randomly, each for 30 cases. In control group, there were 30 cases among which, 12 were male and 18 female, with age ranging from 4 to 6 years (mean  $4.5 \pm 1.5$  years); their disease course was more than 4 weeks; of 30 cases, 7 cases suffered chronic pharyngitis, 8 cases were susceptible, 5 cases had acute bronchitis, 3 cases suffered tracheitis recurrence and 7 cases else. In treatment group, 14 cases were male, 16 female, with age ranging from 3 to 6 years (mean  $4.7 \pm 1.3$  years); their course of disease

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was more than 4 weeks; of 30 cases, 6 cases suffered chronic pharyngitis, 9 cases were susceptible, 5 cases had acute bronchitis, 4 cases suffered tracheitis recurrence and 6 cases else. General materials of these two groups were of no statistic significance ( $P>0.05$ ), thus they were comparable. This experiment has been approved by the medical committee of the Affiliated Hospital of Beihua University and all researches on traditional Chinese medicine treatment followed international standards.

#### **Therapeutic method**

Control group received treatment using conventional therapy including oxygen inhalation, nebulization and anti-infection therapy for 30 days. Treatment group was treated by boil-free traditional Chinese medicine granules (produced by Beijing Tomages Pharmaceutical Co. Ltd, half dose per time, dissolved in 50 to 100mL boiled water; twice a day), besides taking the treatment the same as control group and the treatment course was 30 days. Curative effects of two groups were compared after a week of treatment and the variation of heart rate and oxygen saturation (SpO<sub>2</sub>) were observed.

#### **Daily nursing**

As the patients were children who were with weak self control, they were guarded by medical staff when receiving aerosol inhalation. Meanwhile, as the patients suffered respiratory system disease, the indoor temperature was kept at 25°C and air humidity at about 60% to keep the patients comfortable. Objects, which might produce dust particle such as flower was not allowed to be placed in the room, in case pollen allergy worsens the condition of asthma (Guoqun *et al.*, 2013; Yunfei *et al.*, 2011).

#### **Curative effect criterion**

Cured: the maximum body temperature was lower than 37.2°C (axillary temperature), no rise was observed within one month and meanwhile other clinical symptoms and signs disappeared; effective: the maximum body temperature was lower than the original maximum temperature but higher than 37.3°C, symptoms such as coughing, gasp and labored breathing have remitted obviously, lung rale had reduced obviously, heart rate had recovered to normal level and oxygen saturation rose void: the maximum body temperature was higher than 37.5°C or rose after a fall, main clinical symptoms were not been remitted and symptoms such as labored breathing, arrhythmia and further decline of SpO<sub>2</sub> were observed; in such case, the treatment must be stopped immediately.

### **STATISTICAL ANALYSIS**

Statistical analysis was performed using SPSS 17.0 software. Measurement data was expressed with mean  $\pm$  standard deviation; comparison of measurement data between groups was processed by t test and enumeration

data used  $X^2$  test. Difference was considered as statistically significant if  $P<0.05$ .

### **RESULTS**

#### **Heart rate variation**

The heart rate of two groups had large variation 5 min before aerosol inhalation and 20 min later. Heart rate of both groups was declined to almost normal level and the comparison between before and after inhalation had statistical significance ( $P<0.05$ ). Meanwhile, treatment group had a larger increment degree after receiving oxygen aerosol of traditional Chinese medicine than control group, and the difference was of statistical significance ( $P<0.05$ ). Results are shown in table 1.

#### **Oxygen saturation variation**

SpO<sub>2</sub> of both groups 20 min after aerosol inhalation was higher than 5 min before inhalation and the difference was of statistical significance ( $P<0.05$ ). Meanwhile, after treated by aerosol inhalation, SpO<sub>2</sub> in treatment group was higher than control group and the difference had statistical significance ( $P<0.05$ ). The result is shown in table 2.

#### **Comparison of curative effect**

Totally 28 cases (93.3%) in treatment group obtained effective treatment; while in control group, number of cases was 21 (70%). It was found that, effective rate of treatment group was higher than control group, and the difference was of statistical significance ( $P<0.05$ ). The result is shown in table 3 and the comparison of effective rate is shown in fig. 1.

Long-term low-grade fever of children is mostly caused by symptoms such as chronic pharyngitis and amygdalitis, etc (Mingjing, 2011; Tiangui, 2011; Ying *et al.*, 2012). Meanwhile, mycoplasma infection and weasand or lung infection which are not completely controlled can also lead to long-term low-grade fever. The reason why children suffer long-term low-grade fever is mostly because acute respiratory system infection is not controlled completely. Acute respiratory system infection that occurs to children is classified into "warm disease" by traditional Chinese medicine (Leslie *et al.*, 2010); moreover, some pestilences are also included in the category similar to cold, pneumonia, pharyngitis and trachitis in modern medicine. Incubative Pathogen in Three Seasons states that, "warm evil invades body through mouth and nose and firstly hurts the lung" and "as lung is at the highest position, it is firstly hurt by evil". With respect to immediate onset warm disease, Chen Pingbo held the view that "releasing heat and yin is necessary in the treatment of wind-warm disease".

Respiratory system disease is the most commonly seen disease among children. Children are easy to have disease

**Table 1:** Heart rate variation condition of two groups (mean  $\pm$  standard deviation, b/min)

| Group           | Number of cases | Before treatment | After treatment  |
|-----------------|-----------------|------------------|------------------|
| Treatment group | 30              | 166.3 $\pm$ 10.3 | 125.9 $\pm$ 12.4 |
| Control group   | 30              | 117.9 $\pm$ 10.1 | 120.0 $\pm$ 8.3  |

**Table 2:** SpO2 variation of two groups (mean  $\pm$  standard deviation, %)

| Group           | Number of cases | Cured     | Effective | Void     |
|-----------------|-----------------|-----------|-----------|----------|
| Treatment group | 30              | 19 (63.3) | 9 (30.0)  | 2 (6.7)  |
| Control group   | 30              | 13 (43.3) | 8 (26.7)  | 9 (30.0) |

**Table 3:** Comparison of effective cases (n)

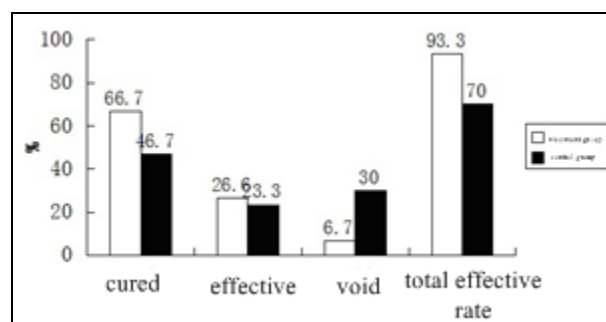
| Group           | Cases (n) | Cured | Effective | Void | Total effective rate (%) |
|-----------------|-----------|-------|-----------|------|--------------------------|
| Treatment group | 30        | 20    | 8         | 2    | 93.3 <sup>▲</sup>        |
| Control group   | 30        | 14    | 7         | 9    | 70.0                     |

Compared with control group, <sup>▲</sup>P<0.05.

of respiratory system after invaded by harm from outside as their body has not been mature. Commonly seen pathogenic microorganisms include bacteria, virus, mycoplasma and Chlamydia, etc. Besides, children respiratory system disease may also be caused by allergic constitution (Quanjian and Yan, 2012). Immaturely developed body is in the leading cause among reasons mentioned above. Based on summary and analysis of the experience of tradition Chinese medicine (Linchun *et al.*, 2012; Yunxia and Weina, 2013; Lei, 2010; Xuehui, 2013) and according to syndrome of immediate onset warm disease, we believe that, the cause is that children with weak viscera are easily to get infected by pathogenic factors especially wind warm and warm heat invaded from outside which can block up children's lung and stomach. Such children get high fever first and still have toxic-heat in lung and stomach due to complete treatment. Some pathogens may still remain at yingfen and yinfe, which leads to continuous low-grade fever accompanied by thirst, vexation and red tongue. Respiratory tract primary lesion of these children is mostly seen in pharyngeal and tonsil. This research suggested the total effective rate of treatment group taking boil-free granule on the basis of conventional treatment including oxygen uptake, aerosol inhalation and anti-infection therapy was 93.3%, distinctly better than control group (P<0.05).

The prescription of boil-free granule used in this study contains bupleurum Chinese, Artemisia annua, scutellaria baicalensis, double blossom, honeysuckle stem, fructus forsythiae, radix isatidis, lalang grass rhizome, bistort rhizome, radix scrophulariae, dried rehmannia root, rhizome anemarrhnae, tree peony bark, blackend swallowwort root, cortex lycii radidis, starwort root, etc. Scutellaria baicalensis, radix isatidis and rhizome anemarrhnae has the function of clearing and discharging lung and stomach, and eliminating heat and toxicity; lalang grass rhizome, radix scrophulariae and tree peony

bark are able to cooling blood and nourishing yin; double blossom and fructus forsythiae can disperse and clear heat; bupleurum Chinese can expel heat out of body as well as evil; besides, Artemisia annua and blackend swallowwort root are effective in eliminating pathogenic heat. To sum up, the prescription combining various herbs can clear heat and toxicity, nourish yin and blood, eliminate pathogenic heat and it can help to adjust temperature of children to normal level (Wenyan and Yan, 2013). In conclusion, boil-free traditional Chinese medicine granules can be applied in the treatment of children long-term low-grade fever caused by respiratory system infection to obviously improve the curative effect, with few untoward effects and high safety.

**Fig. 1:** Comparison of effective rate between two groups

## CONCLUSION

With the help of traditional Chinese medicine in treatment, children with respiratory system disease regain health in short time. Chinese medicine granules in the combination with oxygen atomization inhalation characterized by high effective rate, short treatment cycle and sound curative effect can normalize functions of heart and lung.

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