

# Efficacy comparison of different forms of dog-days acupoint application for prevention and treatment of chronic bronchitis

## 不同形式三伏贴防治慢性支气管炎疗效比较

Liu Yang (刘洋)<sup>1</sup>, Cui Lin-hua (崔林华)<sup>2</sup>, Li Qing (李青)<sup>3</sup>, Xing Xiao (邢潇)<sup>2</sup>, Qi Cong-hui (齐丛会)<sup>2</sup>, Wang Shao-jin (王少锦)<sup>1</sup>  
1 Hebei University of Chinese Medicine, Shijiazhuang 050091, China  
2 Hebei General Hospital, Shijiazhuang 050051, China  
3 The First Hospital of Shijiazhuang, Shijiazhuang 050011, China

### Abstract

**Objective:** To analyze the clinical effect of traditional dog-days acupoint application and Magic Acupuncture Patch (Manji) in the prevention and treatment of chronic bronchitis (CB) in remission stage in the past five years, and explore the principle of action and effective stimulation, to provide the evidence for treating CB by acupoint application.

**Methods:** A retrospective study was conducted on 405 patients with CB who met the inclusion criteria. All patients were treated with dog-days acupoint application or Magic Acupuncture Patch between 2013 and 2017. The clinical data of 405 patients were statistically analyzed to compare the prevention and treatment effects of dog-days acupoint application and Magic Acupuncture Patch, and different degrees of stimulation of dog-days acupoint application.

**Results:** Among the dog-days acupoint application groups, the total effective rate was 63.6% in the light stimulation group, 93.1% in the moderate stimulation group, and 94.8% in the strong stimulation group. The differences in the total effective rate between the light stimulation group and the moderate stimulation group, as well as the strong stimulation group, were statistically significant (both  $P < 0.05$ ). There was no significant difference in the total effective rate between the moderate stimulation group and the strong stimulation group ( $P > 0.05$ ). The total effective rate was 83.9% in the dog-days acupoint application group, versus 45.4% in the Magic Acupuncture Patch group, and there was a statistically significant difference between the two groups ( $P < 0.05$ ).

**Conclusion:** The efficacy of dog-days acupoint application in the prevention and treatment of CB is better than that of Magic Acupuncture Patch; the degree of stimulation is the basis for the effect of dog-days acupoint application on prevention and treatment of CB, and the moderate and strong stimulations are more appropriate.

**Keywords:** Acupoint Therapy; Blistering Therapy; Acupoint Sticking Therapy; Application Therapy; Winter Diseases Summer Treatment; Bronchitis, Chronic

**【摘要】目的:** 通过分析近5年传统三伏贴与曼吉磁贴防治慢性支气管炎(CB)缓解期的临床效果, 探究三伏贴防治CB的作用原理及适宜有效的刺激量, 为穴位贴敷法防治CB提供临床依据。**方法:** 应用回顾性研究方法, 选择符合纳入标准的CB患者405例, 均为2013年至2017年间采用三伏贴或曼吉磁贴防治的患者, 对405患者的临床资料进行统计分析, 比较三伏贴与曼吉磁贴的防治效果, 以及三伏贴不同刺激量的防治效果。**结果:** 三伏贴组中, 轻刺激量组总有效率为63.6%, 中刺激量组总有效率为93.1%, 重刺激量组总有效率为94.8%。轻刺激量组与中刺激量组和重刺激量组的总有效率差异均具有统计学意义(均 $P < 0.05$ ), 中刺激量组与重刺激量组总有效率差异无统计学意义( $P > 0.05$ )。三伏贴组总有效率为83.9%, 曼吉磁贴组总有效率为45.4%, 两组总有效率有统计学差异( $P < 0.05$ )。**结论:** 三伏贴防治CB的疗效优于曼吉磁贴; 刺激量是保证三伏贴防治CB效果的基础, 以中、重度刺激量为宜。

**【关键词】** 穴位疗法; 发泡疗法; 穴位贴敷法; 敷贴疗法; 冬病夏治; 支气管炎, 慢性

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Dog-days acupoint application, also known as dog-days moxibustion, belongs to the category of blistering moxibustion. Moxibustion is a method to apply some blistering drugs to acupoints or affected areas, so that

local congestion and blistering occur, which looks like sores. The application therapy is also known as drug moxibustion and blistering moxibustion. Commonly used Chinese drugs are *Bai Jie Zi (Semen Sinapis Albae)*, *Xi Xin (Herba Asari)*, *Da Suan (Bulbus Allii)*, *Ban Mao (Mylabris)*, etc.<sup>[1]</sup> At present, dog-days acupoint application has been widely used in the prevention and treatment of diseases, especially for those of

**Author:** Liu Yang, master degree candidate  
**Corresponding Author:** Wang Shao-jin, professor, chief physician.  
E-mail: [shaojin26@163.com](mailto:shaojin26@163.com)

respiratory system<sup>[2-4]</sup>. In this study, a retrospective analysis method was used to study dog-days acupoint application and Magic Acupuncture Patch for chronic bronchitis (CB) in remission stage in the past five years. The efficacy was compared between the dog-days acupoint application and Magic Acupuncture Patch to explore the relationship of different degrees of stimulation and therapeutic effects and the principle of prevention and treatment of dog-days acupoint application on CB, thus to provide clinical evidence for the prevention and treatment of CB by acupoint sticking method. The results of the study are reported below.

## 1 Research Methods

### 1.1 Subjects and grouping

This study is a retrospective case analysis. Clinical data of all 405 patients were collected. All patients were enrolled in Acupuncture Department of Hebei General Hospital, Department of Integrative Medicine of the First Hospital of Shijiazhuang, Outpatient Department of Hebei Traditional Chinese Medicine Association and Community Hospital between 2013 and 2017. Dog-days acupoint application or Magic Acupuncture Patch was taken. There were 297 cases in the dog-days acupoint application group and 108 in the Magic Acupuncture Patch group.

### 1.2 Diagnostic criteria

In accordance with the diagnostic criteria of CB in *Practical Internal Medicine*<sup>[5]</sup>.

#### 1.2.1 Diagnostic criteria for CB-stage of attack

① Cough, sputum as the main clinical symptoms or accompanied by wheezing, the incidence lasts for 3 months a year, and more than consecutive 2 years; ② imaging examination, such as X-ray, finds the lung vascular shadows increased, thickened or disordered, appearing as reticular or spotted or strip-like shadow; ③ routine blood examination shows normal white blood cell count and neutrophils, eosinophilia increased or normal. If any one of the above three items was met, diagnosis was confirmed.

#### 1.2.2 Diagnostic criteria for CB in remission stage

① Cough mostly occurs in the morning, but with a burst of cough or sputum during sleep; ② cough with white mucus and serous foamy sputum; ③ accompanied by wheezing. If any one of the above three items was met, diagnosis was confirmed.

### 1.3 Inclusion criteria

In line with the above-mentioned diagnostic criteria for CB in remission stage; used the uniform sticking application adopted in this study; with complete data after the sticking application treatment [after the sticking application, data would be updated from the beginning of winter (November) to the beginning of Spring (February) to track the patients' conditions, all data would be recorded in the dog-days acupoint

application visiting record form. All forms would be completed according to the patient's post-application condition.

### 1.4 Exclusion criteria

Patients with chronic bronchitis in flare; accompanied with other severe diseases such as tuberculosis, pneumoconiosis, bronchiectasis, lung cancer, etc.; patients with blood system diseases; females who were pregnant or breast-feeding.

### 1.5 Rejection criteria

Severe skin allergies after sticking application; incomplete or missed medical records.

### 1.6 Stimulation grading standards

Grading stimulation according to the blisters appeared on the skin after dog-days acupoint application.

Mild: Redness on skin surface.

Moderate: Small grain-size blisters clustered on the surface of the skin.

Strong: The size of the blisters varied from the size of a peanut to a broad bean.

### 1.7 Statistical processing

The SPSS version 23.0 statistical software was used for statistical analysis. The measurement data were expressed as mean  $\pm$  standard deviation ( $\bar{x} \pm s$ ), and processed by *t*-test. The counting data were processed by Chi-square test. The rank data were processed by rank sum test.  $P < 0.05$  indicated statistical significance.

### 1.8 Grouping and comparison of baseline data

There were 297 patients in the dog-days acupoint application group, including 99 patients with mild stimulation, aged 30-65 years old, with duration of 3-15 years; 102 patients with moderate stimulation, aged 30-65 years old, with a duration of 3-15 years; and 96 patients with strong stimulation, aged 30-65 years old, with a duration of 3-15 years. According to statistical analysis, there were no significant differences in gender, age and disease duration among the three groups (all  $P > 0.05$ ), suggesting that the three groups were comparable (Table 1).

In order to eliminate the bias in number between the dog-days acupoint application group and the Magic Acupuncture Patch group, a total of 124 cases, aged 30-65 years old, with a duration of 3-15 years were randomly selected from 297 patients in the dog-days acupoint application group, among which 41 patients with mild stimulation, 42 patients with moderate stimulation, and 41 patients with strong stimulation. One hundred and eight patients in the Magic Acupuncture Patch group were aged 30-65 years old, with a duration of 3-15 years. According to statistical analysis, there were no significant differences in gender, age and disease duration between the two groups (all  $P > 0.05$ ), suggesting that the two groups were comparable (Table 2).

**Table 1. Comparison of three sets of baseline data of different stimulations of dog-days acupoint application**

Group	n	Gender (case)		Average age ( $\bar{x} \pm s$ , year)	Mean course ( $\bar{x} \pm s$ , year)
		Male	Female		
Mild stimulation	99	34	65	53.0±7.7	6.8±2.9
Moderate stimulation group	102	31	71	53.3±8.6	6.6±2.9
Strong stimulation	96	29	67	52.8±8.6	6.4±2.7

**Table 2. Comparison of baseline data between the dog-days acupoint application group and Magic Acupuncture Patch group**

Group	n	Gender (case)		Average age ( $\bar{x} \pm s$ , year)	Mean course ( $\bar{x} \pm s$ , year)
		Male	Female		
Dog-days acupoint application	124	36	88	53.3±8.7	6.9±3.2
Magic Acupuncture Patch	108	31	77	52.9±8.6	7.2±2.9

## 2 Treatment Methods

All clinical data collection centers in this study used uniform formula for dog-days acupoint application, standard acupoints selection and operation methods. The clinicians were all professional acupuncturists. Magic Acupuncture Patch (batch number: YZB/Shanghai 0444-26-2013) is produced by Shanghai Magnet & Biotech Co., Ltd., China, and the application can be standardized. Everything performed here was to avoid research errors to the fullest extent.

### 2.1 Dog-days acupoint application group

Drug composition: The formula foundation of the dog-days acupoint application used in this study followed the Chinese medicine prescription recorded in *Zhang Shi Yi Tong (Zhang's Medical Studies)*<sup>[6]</sup>, Qing Dynasty, which was composed of *Bai Jie Zi (Semen Sinapis Albae)* (pure powder) 37.3 g, *Yan Hu Suo (Rhizoma Corydalis)* 37.3 g, *Gan Sui (Radix Kansui)* and *Xi Xin (Herba Asari)* 18.7 g respectively, ground into fine powder. After which, 1.6 g of *She Xiang (Moschus)* was added, ground with a pestle, then adjusted with ginger juice to make a paste of 1.0 cm in diameter and about 0.5 cm in thickness.

Acupoints for sticking application: Tiantu (CV 22), bilateral Feishu (BL 13) and Gaohuang (BL 43).

Application time: Hot season in Chinese lunar calendar is divided into three periods. Apply the paste to the above acupoints on the first day of each period. Each adult was asked to keep the past for 1-2 h (starting from the time when burning sensation was felt on the skin after the application, due to individual differences, mainly based on individual tolerance). The application was repeated once every 10 d.

Application reaction: After 5-10 min of application, the patient would feel hot, itchy or burning on the skin. One-two days after removing the paste, there would gradually appear a state which was similar to that after

moxibustion on the application spot, i.e., redness, and even blisters with a burning, itching or pain sensation, which would be especially sensed in the middle of the night. The reaction would last for 7-10 d.

Cautions: On the day of application, patients were advised to wear loose clothes made of breathable fabric to avoid excessive sweating. During the application, if the patient felt unbearable burning sensation on the application spot, the paste should be removed immediately. When the drug produced a large blister on the skin, first disinfected it with iodophor, then used a sterile syringe to pump out the liquid from the blister to avoid infection.

### 2.2 Magic Acupuncture Patch group

Patch composition: Magic Acupuncture Patch is an ultra-thin soft plaster made by medical magnetic powder and bio-paste (adhesive) with patented technology. It plays an assistant role in prevention and treatment of diseases which are suitable to be treated by Tian Jiu (blistering moxibustion) therapy, such as CB, bronchial asthma and allergic rhinitis, through physical principles.

Application time: The same as that in the dog-days acupoint application group.

Acupoints for sticking application: The same as those in the dog-days acupoint application group.

Application method: When receiving application, the patient should wear loose clothes made of breathable fabric and rest for 5 min. When the skin was clean and dry, attached the Magic Acupuncture Patch to the above acupoints, and the patch would be kept for 24-48 h each time (or fell off itself).

Application reaction: After application, the patient would gradually feel slight burning, itching and pain, which would last for 24-48 h. After the patch was removed, the local burning, itching and pain sensation gradually disappeared, and there would be no skin reactions such as redness and blistering.

Cautions: Medical tape or band-aid could be used to prevent the patch from falling off. Patients were advised not to take a bath on the day of application, and strenuous exercises should be forbidden.

### 3 Research Results

#### 3.1 Criteria of efficacy

It was in accordance with the criteria in the *Clinical Disease Diagnosis and Efficacy Judgment Criteria*<sup>[7]</sup>.

Excellent: After sticking application, the patient did not have CB attacks in winter, and even if there was an episode, it could relieve itself.

Significant effect: After sticking application, symptoms and signs such as cough, sputum, and wheezing disappeared or improved significantly.

Effective: After sticking application, cough, sputum, wheezing and other symptoms and signs improved, the frequency of CB attacks decreased, and the duration shortened, but the improvement was insignificant.

Invalid: Without any improvements.

#### 3.2 Analysis

3.2.1 Comparison of effects of dog-days acupoint application group among different degrees of stimulation

Evaluated by the rank-sum test, the differences between the mild stimulation group and the moderate stimulation group as well as the strong stimulation group were statistically significant (both  $P < 0.05$ ). There was no statistical difference between the moderate stimulation group and the strong stimulation group ( $P > 0.05$ ), (Table 3).

3.2.2 Comparison of clinical effects between the dog-days acupoint application group and Magic Acupuncture Patch group

The total effective rate of the dog-days acupoint application group was 83.9%, and was 45.4% in the Magic Acupuncture Patch group. Evaluated by the rank sum test, the difference in efficacy between the two groups was statistically significant ( $P < 0.05$ ), (Table 4).

**Table 3. Comparison of the efficacy of dog-days acupoint application among different degrees of stimulation (case)**

Group	n	Excellent	Significant effect	Effective	Invalid	Total effective rate (%)
Mild stimulation	99	2	12	49	36	63.6
Moderate stimulation	102	20	49	26	7	93.1 <sup>1)</sup>
Strong stimulation	96	23	54	14	5	94.8 <sup>1)</sup>

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

**Table 4. Comparison of the efficacy between the dog-days acupoint application group and the Magic Acupuncture Patch group (case)**

Group	n	Excellent	Significant effect	Effective	Invalid	Total effective rate (%)
Dog-days acupoint application	124	16	52	36	20	83.9 <sup>1)</sup>
Magic Acupuncture Patch	108	6	19	24	59	45.4

Note: Compared with the Magic Acupuncture Patch group, 1)  $P < 0.05$

### 4 Discussion

#### 4.1 Discussion on the principle of the dog-days acupoint application in prevention and treatment

Dog-days acupoint application is a moxibustion therapy. It uses drugs with natural stimulating ingredients to function on the body surface through acupoints, where hyperemia, blisters, skin lesions and other similar moxibustion reactions appear on the skin to continuously stimulate the acupoints, and thus displays the specificity of acupoints. Dog-days acupoint application can also play the similar role of the moxibustion method to clean and warm the meridians, dispel the coldness, assist yang and protect healthy qi. Therefore, the prevention and treatment effect of the dog-days acupoint application is based on the effect of moxibustion. The results of this study showed that the

efficacy of the dog-days acupoint application in preventing and treating CB was statistically different from that of the Magic Acupuncture Patch ( $P < 0.05$ ), suggesting that the efficacy of moxibustion-like dog-days acupoint application is better than that of the non-moxibustion-like Magic Acupuncture Patch.

Modern research shows that acupoints receive various stimulations through the conduction of the meridian system (may involve systems such as nervous, endocrine, immune, etc.), while the nerve center (low and high centers) integrates these signals, and then send signals which can regulate visceral tissues. Afterward, the visceral tissues will produce various regulatory signals, namely the acupoint effect<sup>[8]</sup>. Lin XM<sup>[9]</sup> believes that when drugs for blistering-moxibustion are applied to the surface of acupoints, the local skin will appear redness and blistering,

accompanied by itching; what's more, it takes a period of time for the liquid of the blister to be absorbed, thus producing a long-term stimulation to the acupoints. Through the adjustment of acupoint-meridian-organ and viscera system, it can improve the movement of meridian qi and blood and balance the status of yin and yang, finally achieving the purpose of prevention and treatment. Jiao JY, *et al*<sup>[10]</sup> found that blistering moxibustion can affect the specific immune organs in topical skin, causing changes in dendritic cells to regulate human immunity. Zou XJ, *et al*<sup>[11]</sup> observed cantharidin blistering moxibustion and found that the main components in the blister liquid were neutrophils, monocytes and dendritic cells. Compared with peripheral blood, the most significant change happened to dendritic cells, indicating that blistering-moxibustion may play an immunomodulatory role by promoting the recruitment, differentiation and maturation of dendritic cells in the skin. Lin ZS, *et al*<sup>[12]</sup> found that when receiving acupoint application for bronchial asthma, those with blisters occurred showed more significant efficacy and had less flare-ups than those without blisters. Li GX, *et al*<sup>[13]</sup> observed the efficacy of Xiao Chuan plaster in the treatment of bronchial asthma, and the results showed that the clinical efficacy of those with skin lesions was better than that of those with no skin lesions. Shi PY, *et al*<sup>[14]</sup> observed the clinical efficacy of acupoint application with Wu's blistering plaster for prevention and treatment of remission-stage asthma in children, and proved that this method could improve the immune function, and thus could effectively prevent and treat asthma in children.

In summary, moxibustion effect is the key for the dog-days acupoint application to take effect in preventing and treating diseases, while blistering plays a very important role in the initiation of moxibustion effect.

#### 4.2 Discussion on the relationship between the stimulation intensity and therapeutic efficacy of dog-days acupoint application

The results of this study found that the acupoint application with moderate and strong stimulation produced more significant efficacy than that with the mild stimulation, suggesting that there may be a certain correlation between the stimulation intensity and clinical efficacy of dog-days acupoint application.

Factors that may influence moxibustion stimulation include moxibustion area, moxibustion duration, and blistering<sup>[15]</sup>. In this study, the acupoints, the moxibustion area, the dosage of medicines, and the stimulation time were fixed: the medicinal plasters of 1 cm in diameter were applied to the acupoints. Therefore, the degree of stimulation was finally determined by the size of the moxibustion-induced blisters. It was showed that the clinical efficacy of the moderate and strong stimulations accompanied by

blisters was superior to that the mild stimulation without blisters. Xu HB, *et al*<sup>[16]</sup> summarized Song Nan-chang's clinical experience in the application of dog-days blistering application to prevent and treat bronchial asthma. It was found that Song Nan-chang emphasized the importance of blistering, and believed that the size of blister was closely related to the efficacy. The bigger the blister, the longer the stimulation time, the greater the stimulation intensity, and the better the efficacy. On the contrary, if there were no blisters, or only small blisters, the therapeutic efficacy would not be satisfactory. Zhang W, *et al*<sup>[17]</sup> found that using long-snake moxibustion with different levels of blistering effects to treat rheumatoid arthritis produced different clinical effects and the efficacy of blistering moxibustion was far better, and 1.5 g *Ban Mao (Mylabris)* was recommended as the optimal stimulation dose. Sun DL, *et al*<sup>[18]</sup> used different doses of blistering moxibustion to stimulate acupoints, finding that blistering moxibustion promoted the active bone marrow hyperplasia, shortened the continuous low period of leukocytes caused by chemotherapy, and restored the number of white blood cells in advance. The moderate-blistering moxibustion group showed the most significant clinical efficacy. Zhang R, *et al*<sup>[19]</sup> observed the effect of different moxibustion dosages on the auricle microcirculation of mice. The results showed that in a certain range of moxibustion dosage, the effect of strong stimulation to Shenque (CV 8) was more obvious, i.e., the effect of strong stimulation was better than that of mild stimulation. *Yi Zong Jin Jian (Golden Mirror of the Medical Tradition)* emphasizes the use of moxibustion to treat diseases, and a certain degree of stimulation must be achieved to acquire satisfactory efficacy<sup>[20]</sup>. However, more is not always better. Zhang QF<sup>[21]</sup> believes that the body has tolerance to moxibustion stimulation. When the stimulation reaches a certain level, the body will produce a regulation reaction and the stimulation amount at this point is the lowest level to initiate the moxibustion effect; while the other end of the range of stimulation amount is the level causing tolerance. If the stimulation of moxibustion surpasses the patient's tolerance, the adverse reactions may occur, and the moxibustion effect will also be affected. Therefore, it is especially important to find the proper amount of stimulation in the practice.

All of the above literatures suggest that the amount of stimulation is highly correlated with the efficacy.

At present, there are many reports on the clinical application of the dog-days acupoint application to prevent and treat diseases. But, many patients do not know that this therapy actually is a type of blistering moxibustion, and they cannot accept the blisters that occur after strong stimulation, and over-emphasize or exaggerate the discomforts brought by the skin lesions

(itching, exudation of liquid, etc.), which may limit the effects of the dog-days acupoint application therapy and undermine the therapeutic efficacy. Through retrospective analysis of the application principle and clinical efficacy of the dog-days acupoint application, this study has made clear the origin of this therapy and corrected some misunderstandings, which is conducive to improving the clinical efficacy and standardization in promotion of this method.

#### Conflict of Interest

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

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Translator: Lü Ying (吕瑛)