J. Acupunct. Tuina. Sci. 2010, 8 (3): 184-188
DOI: 10.1007/s11726-010-0402-3

Clinical Study

Influence of Acupoint Application Therapy on Biochemical Indexes of Asthma Patients in Remission Period

TONG Qing (童青), LIANG Yi-ping (梁一平), ZHENG Zu-tong (郑祖同)
Community Health Service Center of Ruijin Er Lu Neighborhood, Luwan District, Shanghai 200020, P. R. China

【摘要】目的: 观察穴位敷贴对缓解期哮喘患者血清中嗜酸粒细胞阳离子蛋白(ECP)、6-酮-前列腺素F1α (6-Keto-PGF1α)和血栓素B_2 (TXB_2) 的影响。**方法:** 门诊临床缓解期哮喘患者 300 例，分为治疗组(150 例)和对照组(150 例)，对照组给予基础治疗，治疗组除进行与对照组相同的基础治疗外，于每年 7 月、12 月进行穴位敷贴治疗，连续治疗 2 年为 1 个疗程。两组患者每年复查ECP、6-Keto-PGF1α和TXB_2，填写“哮喘控制测试表”，进行比较分析。**结果:** 经过穴位敷贴后患者发作次数、呼吸困难情况、药物使用频次均较对照组有减少，反映气道炎症的ECP和气道状态的 6-Keto-PGF1α、TXB_2 水平均有明显改善($P<0.05$)。**结论:** 中药穴位敷贴防治哮喘复发确有疗效，对哮喘患者改善症状，以及ECP、6-Keto-PGF1α和TXB_2均有显著良性影响。

【关键词】哮喘; 穴位贴敷法; 针灸疗法

【Abstract】Objective: To observe the influence of acupoint application therapy on serum eosinophilic granulocyte cationic protein (ECP), 6 keto prostaglandin F 1 (6-keto-PGF 1) and thromboxane B_2 (TXB_2). **Methods**: 300 cases of asthma out-patients in a remission period were divided into a treatment group (150 cases) and a control group (150 cases). The control group was given the basic treatment, and the treatment group was given external application on the acupoints in July and December every year, as well as the basic treatment of the control group, with continuous treatment for 2 years as one course. ECP, 6-keto-PGF 1, and TXB_2 were checked every year in the patients of the two groups, and an Asthma Control Test Table was filled in for comparative analysis. **Results**: After the external application on the acupoints, the frequency of seizures, dyspnea and frequency of medication administration of the patients had been more reduced than those in the control group, indicating that the levels of ECP in inflammation of air passage and of 6-eto-GF 1 and TXB_2 were obviously improved ($P<0.05$). **Conclusion**: The herbal application on the acupoints is effective and positively influential to the improvement of the symptoms in the asthma patients and to ECP, 6-keto-PGF 1, and TXB_2 remarkably.

【Key Words】Asthma; Acupoint Sticking Therapy; Acupuncture-moxibustion Therapy
【CLC Number】R246.1
【Document Code】A

Bronchial asthma is a common chronic disease that seriously endangers the health of a human being. It is shown by the relevant documents in recent decades that the incidence of asthma increases annually. It is shown by the investigation held in 2003 by a national cooperative group for prevention and treatment of children’s asthma on the national incidence and relevant risky factors of asthma, that the incidence of asthma is 0.4%-0.5% in China, greatly different in different regions, and that the incidence of asthma in children also increases from 0.9% in 1990 to 1.5% in 2000. It is shown in the investigation held in the Asian pacific region on the current situation of asthma control that half of the sick people suffer from asthmatic symptoms, and 43.0% of patients were hospitalized or sent for emergency treatment because of asthma in the past year, in a very serious state of disease[1]. Using the application of Chinese medical theory of "supporting the anti-pathogenic ability and expelling the pathogen", and summarizing all the clinical experience over the many years, asthma is

Author: TONG Qing (1972-), female, attending physician

prevented and treated by applying asthma ointment on the acupoints in this research group. Now, the relevant report is given in the following.

1 General Materials

Three hundred cases were collected via the out-patient department from 2004 to 2008 of the patients above 16 years old with clinical remission period of asthma (exclusive of chronic bronchial asthma, pulmonary emphysema, and those with severe complications during the external application) in conformity with the diagnostic criteria of *Guide for Prevention and Treatment of Bronchial Asthma* (hereafter referred to as "Guide"), including 164 males and 136 females, with the average age of 38 6 years old. 300 cases of the patients were randomly divided into 150 cases in the treatment group and 150 cases in the control group by out-patient number. In the treatment group, there were 78 males and 72 females, with the age ranging from 39 to 85 years old, with the average age of 37±8, and with the duration ranging from 1.5-25 years, with the average year of 16.05±6.10. In the control group, there were 84 males and 66 females, with the age ranging from 14 to 54 years old, an average age of 38±7, and with the duration ranging from 15-25 years, an average year of 17.39±6.24. There was no statistical significance in comparison of the general materials of the gender, age and duration in the patients of the two groups.

2 Therapeutic Methods

2.1 Control group

The basic treatment and regular recheck were given, including administration of bronchodilator upon request. If the pathological situation changed during the treatment, the relevant expectant treatment was given. For instance, anti-inflammatory treatment was given, if emergent seizure was aggravated.

2.2 Treatment group

In addition to the basic treatment (same as the control group), the external application was given starting from July every year.

Acupoints: Bilateral Feishu (BL 13) and Gaohuang (BL 43), Huagai (CV 20), Danzhong (CV 17).

Operation: The herbal drug is asthma ointment, mainly made by *Gan Sui* (Radix Kansui), *Xi Xin* (Herba Asari), *Bai Jie Zi* (Semen Sinapis Albae) (designed and manufactured by Community Health Service Center of Ruijing Er Lu Neighborhood, Luwan District, Shanghai). The ointment was applied once a week, totally for six sessions. Then, another six sessions were repeated in December of the same year, continuously for two years making one course.

3 Therapeutic Effects

3.1 Observation Indexes

The changing situation in the levels of ECP, 6-keto-PGF 1, and TXB_2 were checked before and during the observation every year. 3 mL fasting vein blood sample was extracted from the subjects into the glass tube, and then blood was coagulated in room temperature and serum was separated by centrifugation one hour later and sent to the radio-immune laboratory in the Luwan branch of Ruijin Hospital for testing. The patients were followed up once every year and asked to fill in the Asthma Control Test Table, for assessment of the asthma seizures in the previous year.

3.2 Test methods

6-keto-PGF 1 and TXB_2 were tested by radio-immunity analysis. ECP was tested by isotope assay.

3.3 Methods of statistics

The data were analyzed with SPSS11.5 statistic software. The measuring materials were analyzed by *t* test, and the counting materials were analyzed by Chi-square.

3.4 Results

3.4.1 Improvement of clinical symptoms

The patients in the treatment group were followed up once every year before the treatment and during the external application. It is indicated by the Asthma Control Test Table that to the twelve months, the frequency of seizures, dyspnea and frequency of medication administration of every

month were not obviously different, and that 24 months later after the treatments, the improvement was more obvious in the treatment group than in the control group (P<0.05, table 1 and table 2).

3.4.2 Comparison of Biochemical Indexes before and after Treatment

Before the treatment, there was no obvious difference in comparison of ECP, TXB_2, 6-Keto-PGF1α, TXB_2/6-Keto-PGF1α (T/6) between the treatment group and control group. After the treatments by external application on the acupoints for two years, the levels of serum ECP and TXB_2 decreased in the treatment group, with a statistical significance in comparison between the treatment group and control group (P<0.05), and 6-Keto-PGF1α was obviously elevated (P<0.05) and T/6 decreased (P<0.01, table 3).

Table 1. Scores of Asthma Control Test Table (treated by 12 months) in two groups ($\bar{x} \pm s$)

Groups	Hindered daily action	Dyspnea	Night or morning waking	Emergency drugs	Control	Total score
Treatment	4.12±0.02	4.02±0.14	4.08±0.02	3.90±0.13	4.70±0.21	20.50±0.12
Control	4.05±0.12	4.03±0.22	4.05±0.04	3.86±0.14	4.65±0.10	20.25±0.42

Table 2. Scores of Asthma Control Test Table (treated by 12 months) in two groups ($\bar{x} \pm s$)

Groups	Hindered Daily Action	Dyspnea	Night or Morning Waking	Emergency Drugs	Contol	Total Score
Treatment	4.85±0.14[1)]	4.75±0.24 [1)]	4.65±0.33 [1)]	4.50±0.15 [1)]	4.85±0.15[1)]	24.70±0.23 [1)]
Control	4.01±0.10	4.05±0.12	4.03±0.02	3.75±0.20	4.70±0.15	20.21±0.35

Note: Total score = 25 means complete control. Total score ≥20, but ≤ 24 means partial control. Total score < 20 means no control. Compared with the control group, 1) P<0.05

Table 3. Comparison of ECP 、TXB_2、6-Keto-PGF1α、T/6 before and after treatments in two groups ($\bar{x} \pm s$)

Groups	ECP(μg/L)		TXB_2 (pg/mL)		6-Keto-PGF1α(pg/mL)		T／6	
	Before	After	Before	After	Before	After	Before	After
Treatment	10.50±0.71	7.06±0.76[1)3)]	92.82±4.78	74.59±4.56[1)3)]	18.26±6.35	27.50±3.63[1)3)]	4.68±2.42	2.85±1.43[2)4)]
Control	11.45±0.85	11.02± 0.75	93.02±6.63	94.50±5.54	17.75±4.42	16.83±3.22	5.24±0.53	5.57±0.53

Note: In comparison within the group before the treatment, 1) $P < 0.05$，2) $P < 0.01$; In comparison with the control group of same period, 3) $P < 0.05$, 4) $P < 0.01$

4 Discussion

Asthma is a chronic airway inflammatory disease in association with multiple cells, including the airway inflammatory cells and the structure cells and cellular elements. According to the clinical manifestations, asthma can be divided into an acute exacerbation period, a chronic persistent period and a clinical remission period. The clinical remission period refers to that "with or without treatment, the symptoms and signs and pulmonary functions are restored to the levels before exacerbation and maintained for over three months" [2]. ECP is a kind of inflammatory medium released by an active oxyphil cell and can induce damage and exfoliation of the epithelial cell of bronchi, so as to cause contraction of the bronchi, and hence asthma. Prostacyclin (PGI_2) is mainly synthesized in the vascular endotheliocyte and has a strong diastolic effect on the bronchi and smooth muscle of the small airways. It becomes a stable 6-Keto-PGF1α after hydrolysis, providing a protective effect to the airways. The internal peroxide of PG produces thromboxane A_2 (TXA_2), which has a strong effect to contract the smooth muscle of the respiratory tract, and becomes a very low active TXB_2 after dehydrolysis, which is one of the main substances that cause bronchial asthma. It can be seen that the serum biochemical levels of asthma patients are highly valuable for assessment of the airway status of asthma patients for recommendation of clinical medications. When cough, sputum and wheezing symptoms of asthma patients are controlled, the levels of serum ECP and TXB_2 are reduced, but 6-Keto-PGF1α is elevated and T/6 is reduced[3]. The above findings indicate that the acupoint application therapy is of clinical significance for interfering and controlling asthma, mainly in the following aspects.

4.1 Clinical results indirectly prove the existence of clinical remission in asthma.

Based upon the newly revised *Guide for Prevention and Treatment of Bronchial Asthma*, asthma is divided into the acute exacerbation period, chronic persistent period and the clinical remission period in period classification, which remains a dispute in academic circles, because in *Global Initiative for Asthma*, there is no clear and definite clinical remission period. But, judging from the data determined in the control group and treatment group, serum ECP, 6-Keto-PGF1α and TXB_2 levels are different from the normal references, and the Asthma Control Test Table shows that the symptoms are almost under control. It can be seen that "period classification" in association with the situation in China in *Guide for Prevention and Treatment of Bronchial Asthma* is certain rational.

4.2 Positive significance of acupoint application therapy for improving the symptoms of the patients in the remission period.

The acupoint application therapy is a therapy modality, earliest seen in *Wu Shi Er Bing Fang* (Fifty-two Prescriptions), using a herbal paste processed by mixing various herbal powders with liquids onto the specific acupoints, to cause congestion of the local skin to form blisters by stimulation of herbal stuffs on the acupoints and meridians, to excite the meridian qi and promote the smooth flow of the local meridians to reinforce qi and blood in order to prevent and treat diseases[4]. Bronchial asthma belongs to the scope of "Wheezing Pattern" and "Panting Pattern" in Chinese medicine. In our center, a large number of the patients with asthma were analyzed in terms of TCM pattern identification. The results showed that most patients had invasion of cold pathogen into the collaterals and accumulation of phlegm in the lung. Based upon the therapeutic principle that "the patients with phlegm should be harmonized with warm herbs", asthma ointment, designed and manufactured in the center, mainly composed of *Gan Sui* (Radix Kansui), *Xi Xin* (Herba Asari), *Bai Jie Zi* (Semen Sinapis Albae) that can warm yang and disperse phlegm, for external application on the acupoints, can effectively prevent reoccurrence of asthma and effectively improve the symptoms of the patients in the clinical remission period.

4.3 Acupoint application therapy has a positive effect for preventing and controlling asthma.

It has been proven by a large number of materials at home and abroad that the more severe the asthma seizure is, the higher the serum ECP levels will be. Once the symptoms disappear, serum ECP will drop. Serum ECP levels decide the pathological situation and severity of the asthma seizure[5]. It is also reported that the production of thromboxane A, and relevant prostaglandin D_2, and prostacyclin (PGI_2) is higher than the normal adults. Those substances can induce the basic characteristics of the above-described asthma[6]. The results showed that serum biochemical indexes are obviously improved in the patients from the treatment group, and 18-24 months later, the patients feel subjectively that the symptoms are relieved, identical to blood biochemical indexes, proving that the asthma ointment designed and manufactured in our center is very effective for prevention of asthma seizures.

In Chinese medicine, there is a saying that "the symptoms should be treated in emergency, and the causative reason should be dealt with in remission". Although asthma is divided as cold, heat, deficient or excessive pattern, its pathogenesis is no more than an accumulation of long-term phlegm in the lung, and invasion of pathogenic cold. In accordance with the therapeutic principle that "the patients with phlegm should be harmonized with warm herbs", asthma ointment is designed and manufactured in the center, mainly composed of *Gan Sui* (Radix Kansui), *Gan Jiang* (Rhizoma Zingiberis), *Xi Xin* (Herba Asari), *Bai Jie Zi* (Semen Sinapis Albae) that can warm yang and disperse phlegm, for external application on the acupoints. In asthma ointment, *Gan Jiang* (Rhizoma Zingiberis) and *Xi Xin* (Herba Asari) can expel wind, disperse cold, stop pain, and warm the lung and dissolve phlegm. *Bai Jie Zi* (Semen Sinapis Albae) can warm the lung and dissipate phlegm. *Gan Sui* (Radix Kansui) is a strong drug to remove water and can promote the flow of water and relieve salivation. *Ma Huang* (Herba Ephedrae) is an important herb to relieve wheezing and can warm yang and dissolve phlegm in combination with *Gui Zhi* (Ramulus Cinnamomi). *Ding Xiang* (Flos Caryophylli), *Rou Gui* (Cortex Cinnamomi), *HuaJiao* (Fructus Zanthoxyli) can warm yang and disperse cold, and

moreover can help herbs to infiltrate into the acupoints through its pungent, heat and migrating properties. The combination of various herbs can perform the same effects and expel pathogenic cold and dissolve intractable phlegm. Once water is decreased, wheezing can be relieved. Danzhong (CV 17), an influential acupoint of qi, can decline qi and regulate qi, clean the lung and dissolve phlegm. Gaohuang (BL 43) mainly indicated for cough and wheezing due to depletion and often used for chronic asthma, is combined with Feishu (BL 13), a Back-Shu point for diseases of five Zang organs, to benefit the lung and relieve wheezing, plus Huagai (CV 20) to dilate the chest and help the diaphragm. All those acupoints can be used to double the therapeutic effects for dealing with both the symptoms and causative factors. For the treatment of asthma patients in the remission period, the acupoint application therapy is painless, effective and has few side effects and is easily accepted by the patients. It can be proved by the experimental results in this article that the internal environment of the patients can be altered by application of the principle "to support the anti-pathogenic ability and expel pathogens". The satisfactory therapeutic results can be achieved by external application of the herbal product on the acupoints for asthma, so as to prevent and treat the disease.

References

[1] ZHOU En-ling. Analysis of Dependence in Prevention and Treatment of Asthma Patients. Shanxi Medical Journal, 2009, 38(6): 501-502.
[2] Guide for Prevention and Treatment of Bronchial Asthma. Chinese Journal of Tuberculosis and Respiratory Diseases, 2003, 26(3):132-138.
[3] QIU Cheng, LONG Li-ping, JIN Qin, et al. Changes of Serum TXB_2 and 6-K-PGF1α in Children with Asthma. The Journal of Clinical Pediatrics, 1992, 10(2): 120.
[4] ZHOU Wei, WANG Li-ping, HANG Shu-yuan. Clinical Application of Acupoint Sticking Therapy. Chinese Acupuncture & Moxibustion. 2006, 26(12): 899-903.
[5] Koh YY, Kang H, Kim CK. Ratio of Serum Eosinophil Cationic Protein／Blood Eosinophil Counts in Children with Asthma Comparison Between Acute Exacerbation and Clinical Remission. Allergy Asthma Proc, 2003, 24(4): 269-274.
[6] GUO Guang-zu, FU Li-juan. Significance of Serum 6-K-PGF1α、ET、TXB_2 Levels in Supervision of Asthma. Guide of Chinese Medicine, 2009, 7(6): 102-103.

Translator: HUANG Guo-qi (黄国琪)

Received Date: January 20, 2010

● Related Link ●

Delphi Project in Bronchial Asthma

From the paediatric point of view, we have undertaken two Delphi studies into bronchial asthma. The first is related to the consensus known as the consensus document of the five associations. The second is more recent and has been undertaken with GEMA (the Spanish Guidelines on the Management of Asthma). The aim of this paper is to carry out a descriptive study comparing the 2 Delphi processes and to objectively assess if in some way behaviour over the past two years has changed as far as expert opinion is concerned. In the consensus document those points giving rise to most controversy were the treatment of children under three years of age and treatment with immunotherapy in allergic asthma. It is also necessary to highlight how important it was at that particular point in time to define the phenotypes of wheezing and the predictive index of asthma in children of less than 3 years of age. Of the 52 questions in the questionnaire, in 13.6% the panel of experts reached no consensus in their positions. Following GEMA the Delphi methodology, 56 questions were asked in the first round of the questionnaire, and consensus was reached in 87.5%. As regards the paediatric part relating to diagnosis and treatment in children, agreement was reached on all the questions in the first round. Agreement was reached in 8.92% questions in the second round. Clinical guidelines and consensus documents can modify behaviour towards an illness, both in the diagnosis and treatment.

Selected from Fernández-Benítez M, Ibero Iborra M, Sanz Ortega J, et al. Delphi Project in Bronchial Asthma. Curr Med Res Opin, 2010 May 13 [Epub ahead of print].

