

## CASE REPORT

# Acupuncture Resulting in Immediate Bronchodilating Response in Asthma Patients

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There are some encouraging results in the English literature that show acupuncture resulting in an immediate improvement in pulmonary function, but there are also studies that have not demonstrated any benefit. We present 3 patients with persistent asthma who experienced immediate bronchodilatation after acupuncture without the use of any short-acting bronchodilator. After needle stimulation on selected acupoints, clinical symptoms such as dyspnea and wheezing improved. Pulmonary function test showed immediate improvement in forced expiratory volume in 1 second (FEV<sub>1</sub>), more than 20% as compared with baseline FEV<sub>1</sub>. Pulmonary function returned to baseline within 4 hours after acupuncture in 2 patients. From our observations of these 3 asthma patients, acupuncture may improve clinical dyspnea symptoms and performance on pulmonary function tests. Further large-scale controlled studies should be conducted to determine the effectiveness of acupuncture in the treatment of asthma. [*J Chin Med Assoc* 2005; 68(12):591–594]

**Key Words:** acupuncture, asthma, spirometry

## Introduction

Acupuncture has been used for thousands of years, and many patients believe that it is effective in the treatment of a variety of chronic conditions, including asthma.<sup>1,2</sup> A previous study has described the possible effect of acupuncture in the treatment of asthma.<sup>3</sup> Although acupuncture has gained increasing popularity in modern health care, it is only usually used for clinical not physiologic improvement of asthma.<sup>4</sup>

The National Institutes of Health, in a Fall 1997 consensus statement on acupuncture,<sup>5</sup> indicated that acupuncture was useful in pain control and might be a useful adjunct treatment for the management of asthma. According to previously published literature, acupuncture has been shown to have an immediate effect on relieving the symptoms of asthma,<sup>4</sup> but there is not enough evidence of a lasting effect. Only a few studies have demonstrated that acupuncture has beneficial clinical and physiologic effects on asthma, includ-

ing on the immunomodulatory effects of inflammatory cells and cytokines in some asthma patients.<sup>6</sup>

## Case Reports

Here, we describe 3 asthma patients with clinical diagnosis by chronic intermittent or recurrent dry cough, chest tightness, dyspnea, or wheezing. Spirometry showed significant bronchodilatation with over 15% improvement in forced expiratory volume in 1 second (FEV<sub>1</sub>) with inhalation bronchodilator within 3 months before our application of acupuncture. All 3 patients received irregular clinical evaluation and management of asthma. Because of their previous experiences of palpitation or tachycardia after inhalation of short-acting beta-agonists, they sometimes refused these drugs even during acute asthma attacks and searched for alternative treatment, including acupuncture.

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**Table 1.** Spirometry results before and after acupuncture

Case	FEV <sub>1</sub> (l) and FVC (l) before acupuncture			FEV <sub>1</sub> (l) and FVC (l) 20–30 min after acupuncture			% Improvement in FEV <sub>1</sub> post-acupuncture*	FEV <sub>1</sub> (l) 4 hr after acupuncture
	FEV <sub>1</sub>	FVC	FEV <sub>1</sub> /FVC	FEV <sub>1</sub>	FVC	FEV <sub>1</sub> /FVC		
1	0.75	1.87	40%	0.98	2.53	39%	30%	0.77
2	0.65	2.29	28%	1.05	2.89	36%	62%	0.68
3	0.73	1.55	47%	1.03	2.42	43%	41%	0.76

\*Percent improvement in FEV<sub>1</sub> post-acupuncture = (FEV<sub>1</sub> post-acupuncture – FEV<sub>1</sub> pre-acupuncture)/FEV<sub>1</sub> pre-acupuncture × 100

FEV<sub>1</sub> = forced expiratory volume in 1 second; FVC = forced vital capacity.

Neither oral nor inhalation bronchodilators were used during the 24 hours prior to acupuncture. Acupuncture was performed by an experienced doctor via stimulation on acupoints: lung 7, large intestine 4, pericardium 6, stomach 40, large intestine 11, and pericardium 3. Each needle was kept in place for 10 minutes and then removed. Sessions were completed within 20 minutes and associated with the somato-sensory reaction of a deqi sensation. Spirometry and clinical symptoms were checked 5 minutes before, 20–30 minutes and 4 hours after the completion of acupuncture. The results of spirometry before and after acupuncture are summarized in Table 1.

### Case 1

A 76-year-old man had smoked for 2 decades but has quit for over 30 years. He had a history of chronic intermittent dry cough and dyspnea for 20 years. Asthma was diagnosed by clinical symptoms and pulmonary function test 18 years before this admission. He only received irregular control of asthma. The patient visited our clinic with the chief complaints of progressive worsening dyspnea and wheezing for 1 week. Bilateral wheezing breath sounds were heard on chest auscultation. Before treatment, baseline spirometry study showed an FEV<sub>1</sub> of 0.75 L and forced vital capacity (FVC) of 1.87 L. The follow-up pulmonary function test 20–30 minutes after the completion of acupuncture showed an FEV<sub>1</sub> of 0.98 L and FVC of 2.53 L (a 30% improvement in FEV<sub>1</sub> post-acupuncture). However, FEV<sub>1</sub> returned to 0.77 L 4 hours after acupuncture. The patient felt subjective improvement of dyspnea but there was persistent mild wheezing on auscultation after acupuncture. Inhalation of ipratropium bromide increased FEV<sub>1</sub> from 0.77 L to 1.04 L later in the same day.

### Case 2

A 46-year-old woman with no smoking history had a history of intermittent dry cough and dyspnea for over 30 years. Asthma was diagnosed in childhood, but she received only irregular use of inhalation drugs.

She visited our clinic due to recurrence of cough, dyspnea and wheezing during menses. Diminished breath sounds with wheezing over bilateral lung fields were heard on chest auscultation. Baseline spirometry showed an FEV<sub>1</sub> of 0.65 L and FVC of 2.29 L. The follow-up pulmonary function test 20–30 minutes after the completion of acupuncture showed an FEV<sub>1</sub> of 1.05 L and FVC of 2.89 L (a 62% improvement in FEV<sub>1</sub> post-acupuncture). At the same time, the patient felt subjective improvement of dyspnea. Four hours later, after an explanation to the patient, acupuncture was performed on a set of placebo acupoints: 2 placebo acupoints on the medial aspect of the left lower leg and left arm were stimulated. No improvement in pulmonary function was observed with sham acupuncture (FEV<sub>1</sub> and FVC were 0.68 L and 2.32 L before, and 0.65 L and 2.76 L after).

### Case 3

A 48-year-old man with no smoking history had a history of intermittent dry cough and dyspnea for about 30 years. Asthma was diagnosed 26 years before this admission. He visited our clinic due to progressive worsening dyspnea and wheezing for 3 days after a common cold. Bilateral diminished and wheezing breath sounds were heard on chest auscultation. He requested to receive acupuncture treatment. Baseline spirometry showed an FEV<sub>1</sub> of 0.73 L and FVC of 1.55 L. The follow-up pulmonary function test 30 minutes after the completion of acupuncture showed an FEV<sub>1</sub> of 1.03 L and FVC of 2.42 L (a 41% improvement in FEV<sub>1</sub> post-acupuncture). At the same time, the patient felt subjective improvement of dyspnea and no objective wheezing. Oral steroid and inhalation of bronchodilator were used later. The next morning, repeated acupuncture before the patient used bronchodilator resulted in a similar bronchodilating response as the previous day's (FEV<sub>1</sub> and FVC changed from 1.05 L and 2.03 L before acupuncture to 1.23 L and 2.14 L, respectively, 25 minutes after completion of therapy, with a 17% improvement in FEV<sub>1</sub>).

## Discussion

According to traditional Chinese medicine (TCM), acupuncture is a suitable treatment for complex chronic diseases, including bronchial asthma. The chronicity of bronchial asthma and the fear of steroid therapy lead many asthmatic patients to search for alternative methods of treatment such as acupuncture, herbal medicine and massage therapy. TCM is based on the principle that the balance between 2 forces (yin and yang) is the key to health. An imbalance of either force usually results in a disease state. Each method of TCM, including exercise, massage, acupuncture, and herbal therapy, is considered to restore the balance, and acupuncture is considered to be effective in the treatment of asthma in TCM.

In 1976, Yu and Lee<sup>3</sup> demonstrated that acupuncture had a short-term effect on bronchial asthma. Then in 1982, Takishima et al<sup>7</sup> demonstrated that acupuncture caused a short-term reduction in airway resistance. However, published data on this subject are controversial. Some studies were designed and performed to test for short-term acupuncture effects on asthma and reported improvement in patients' well-being significantly during later years,<sup>4</sup> while significant objective improvement in physiologic data from pulmonary function tests was scanty in Kleijnen et al's review of 13 controlled trials in 1991<sup>8</sup> and in Martin et al's meta-analysis of 11 randomized controlled trials in 2002.<sup>9</sup> Multiple sets of acupoints have also been used in different studies to relieve patients' asthma symptoms.

Our patients, who all had clinical diagnoses of bronchial asthma for many years, had symptoms of chronic recurrent respiratory symptoms including dyspnea, cough and wheezing. Significant bronchodilatation was found in all 3 patients by the bronchodilator test within 3 months prior to acupuncture treatment. Because of their previous experiences of discomfort on inhalation of beta-agonists and the desire to search for alternative treatments, these patients requested acupuncture as an alternative asthma treatment. The choices of the acupoints lung 7, large intestine 4, pericardium 6, stomach 40, large intestine 11, and pericardium 3 were based on our previous effective clinical experiences of applications of acupuncture for asthma. Duration of stimulation was kept to only 10 minutes for each acupoint to shorten the total treatment duration to less than 20 minutes. Spirometry was performed 5 minutes before and 20–30 minutes after the completion of acupuncture to determine if acupuncture has an immediate bronchodilator effect.

In our practice, all 3 cases showed significant immediate improvement in FEV<sub>1</sub> after acupuncture (> 15% when compared with FEV<sub>1</sub> before acupuncture). The second patient even showed over 60% improvement in FEV<sub>1</sub> with acupuncture, but no significant improvement in FEV<sub>1</sub> after placebo stimulation. The third patient showed repeated bronchodilatation after acupuncture stimulation on 2 successive days, so it would appear that it is possible to reproduce the bronchodilating effect of acupuncture. In the first 2 cases, the bronchodilating effect of acupuncture disappeared 4 hours after the completion of acupuncture, and the FEV<sub>1</sub> decreased to near the baseline level as measured before acupuncture. After acupuncture, subjective improvement in clinical symptoms including cough or dyspnea was found in all 3 patients.

The benefit of acupuncture in asthma patients documented in a previous study demonstrated subjective clinical improvement, like clinical scores,<sup>10</sup> while there was a lack of objective improvement in spirometry in a previous large-scale study.<sup>11</sup> The lack of a standard method of acupuncture stimulation and standard acupoints for asthma management may be one of the important causes of clinical inefficacy to prove the role of acupuncture in asthma management. In addition, the somatosensation of deqi, a sensation representative of effective application, with soreness, numbness, fullness, and pain, is only a subjective feeling to indicate the proper adequate manual stimulation of acupuncture, but is not an objective finding. It is not yet known which population of asthma patients (age, severity classified by spirometry, acute or chronic, medication differences) has a correlation with significant bronchodilating effect. It is also not certain as to which acupoints and patterns of stimulation will result in greatest improvement in spirometry results. It is difficult to perform a well-controlled study on the effective application of acupuncture in asthma patients.

According to our limited observations, acupuncture at certain acupoints may result in subjective clinical improvement and even immediate physiologic improvement in FEV<sub>1</sub> in selected asthma patients. Further studies on larger patient populations are needed to investigate the exact effect and indication for acupuncture in the treatment of asthma.

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