

SOUTH BAYLO UNIVERSITY

The Evidence for Effectiveness of Acupuncture in Bronchial Asthma

by

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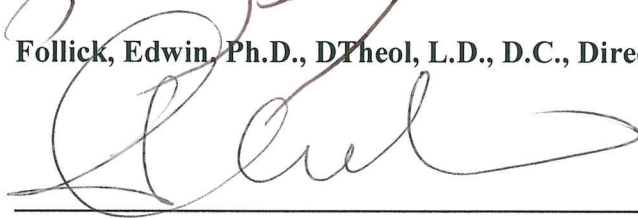
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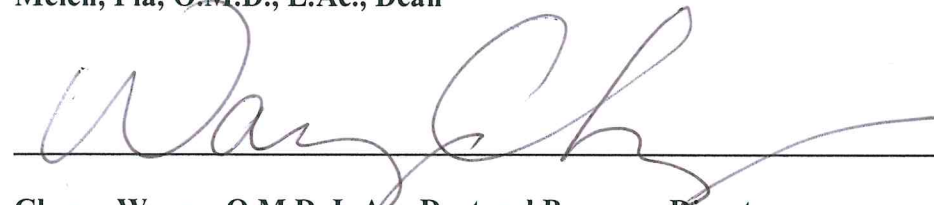
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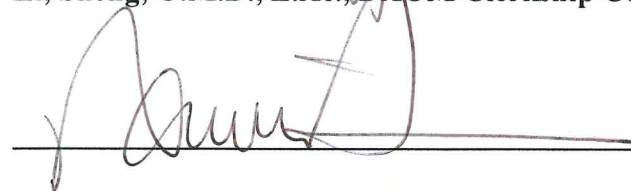
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ABSTRACT

Bronchial asthma is a chronic disease of respiratory tract. Inflammation plays an important role in its etiology. Modern medicine offers treatments based on agonists of β -adrenergic receptors, leading to the dilatation of muscles in the bronchi and anti-inflammatory drugs, mostly steroids. In this situation, many patients look for other therapies, including acupuncture. Acupuncture is an effective therapeutic method in asthma treatment in traditional Asian medicine. This paper reviewed a number of clinical trials and outcome studies on the use of acupuncture to treat asthma and assesses the effects of acupuncture for the treatment of asthma or asthma-like symptoms.

Randomized and possibly randomized trials were using needle acupuncture or other forms of modality. And this study used the PubMed as a main search engine and search the years of publication of the article from January 1982 to December, 2016. Literature was also identified by citation tracking using reference lists from papers and internet searching. In view of the fact that the effects after real and sham acupuncture were slightly positive and demonstrated evidence for the efficacy of appropriate acupuncture for some immunological parameters, for experiences of asthma symptoms, level of medication use and quality of life.

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I. INTRODUCTION

This study is to perform a narrative review of the efficacy of various types of acupuncture in the treatment of asthma. Asthma is a common chronic inflammatory disease of the airways characterized by variable and recurring symptoms, reversible airflow obstruction and bronchospasm. Common symptoms include wheezing, coughing, chest tightness, and shortness of breath. Asthma is thought to be caused by a combination of genetic and environmental factors. Its diagnosis is usually based on the pattern of symptoms, response to therapy over time and spirometry. It is clinically classified according to the frequency of symptoms, forced expiratory volume in one second, and peak expiratory flow rate. Asthma may also be classified as atopic or non-atopic (intrinsic) where atopy refers to a predisposition toward developing type 1 hypersensitivity reactions. Treatment of acute symptoms is usually with an inhaled short acting beta-2 agonist (such as salbutamol) and oral corticosteroids¹. In very severe cases, intravenous corticosteroids, magnesium sulfate, and hospitalization may be required. Symptoms can be prevented by avoiding triggers, such as allergens and irritants, and by the use of inhaled corticosteroids. Long-acting beta agonists (LABA) or antileukotriene agents may be used in addition to inhaled corticosteroids if asthma symptoms remain uncontrolled. The occurrences of asthma have increased significantly since the 1970s. In 2011, 235-300 million people globally were diagnosed with asthma, and it caused 250,000 deaths². Acupuncture, in the form of Asian medicine with needles, as well as electro-acupuncture, laser acupuncture, and transcutaneous electrical nerve stimulation, has been used for thousands of years as a treatment for a wide range of conditions. In recent years, in the Western public demand for such alternative therapies has been growing steadily. Many believe that acupuncture

is effective in the treatment of asthma, but there is little published scientific data to support this treatment. Most published studies are based on relatively small numbers of patients and very rarely has a double-blind protocol been used. Therefore, This study was conducted a formal narrative review of some randomized clinical trials in the published literature that have compared acupuncture at real and placebo points or treatments in asthma patients.

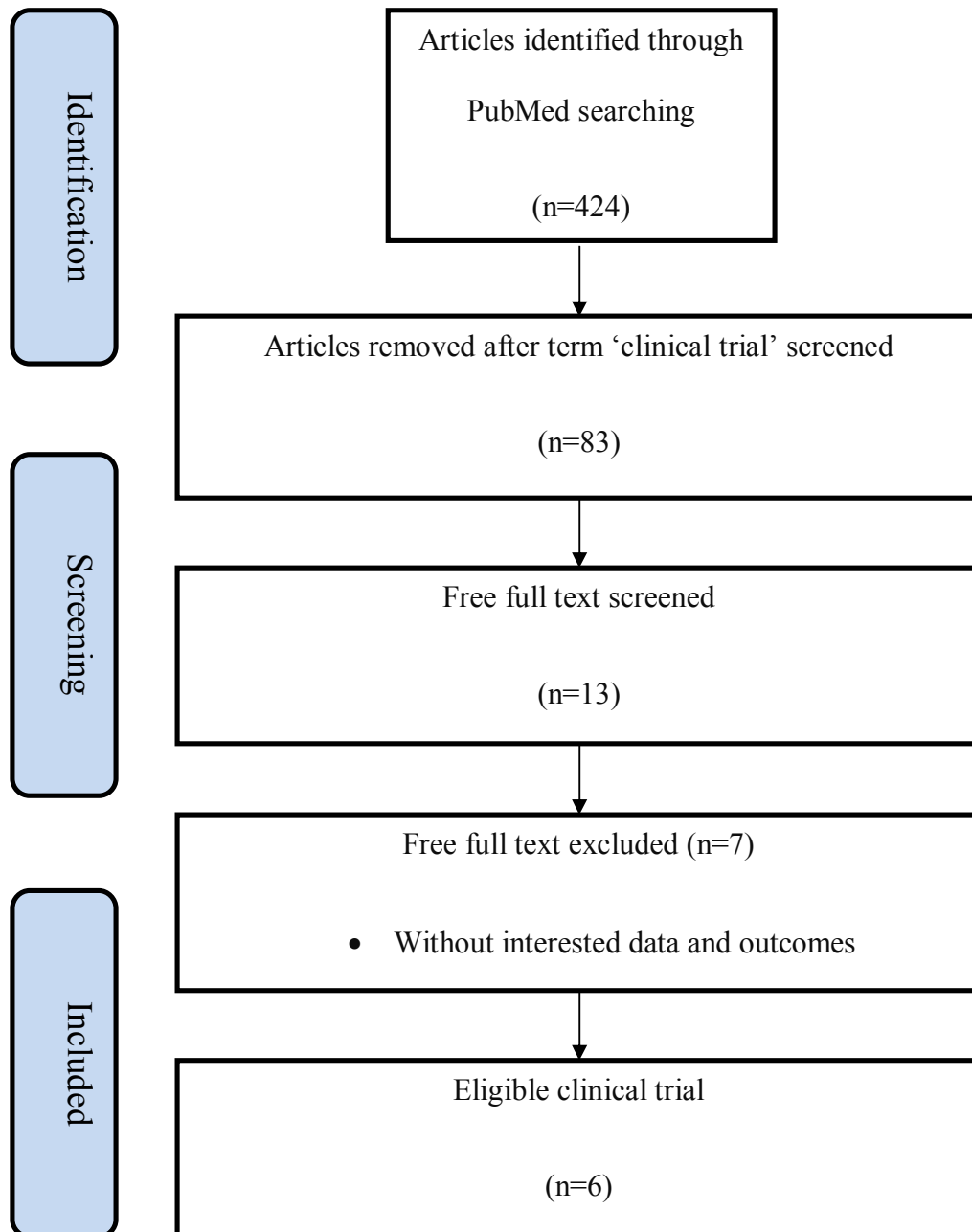
II. MATERIALS & METHODS

This study type is a narrative review using evidence from literature to summarize critical clinical aspects of asthma. It used the PubMed as a main search engine and searched the years of publication of the articles from January 01, 1982 to December 31, 2016.

Literature was also identified by citation tracking using reference lists from papers and internet searching. The terms ‘acupuncture’ and ‘asthma’ were used for searching and total of 424 articles were searched, and it was narrow down to 83 articles using the term ‘clinical trial’ as an article types, and filtered 13 articles from free full texts, among which; 6 articles were reviewed in this study. The inclusion criteria was modality, study types, study designs. Modalities include ‘acupuncture’, ‘laser acupuncture’, ‘electro-acupuncture’. Study types include ‘clinical trials’, ‘case studies’. Moreover, the study design has to be specified as controled methods. The exclusion criterions such as ‘acupressure’, ‘massage’, ‘acupoints’, ‘cupping’, ‘moxibustion’ for modalities, and ‘animal studies’, ‘surveys’, ‘observational studies’ for study types were set as well. Lastly, study designs without control methods were excluded.

The flow diagram of study selection and identification are given in Figure 1

Fig.1. Flow diagram of study selection and identification.



III. RESULTS

The first article reviewed was a recent study by Wechsler ME, et al³, finding little evidence for an effect of acupuncture as a treatment for asthma, but was not surprised by the result. They randomly assigned 46 patients with asthma to active treatment with an albuterol inhaler, a placebo inhaler, sham acupuncture, or no intervention. They used a block design and administered one each of these four interventions in random order during four sequential visits (3 to 7 days apart); this procedure was repeated in two more blocks of visits (for a total of 12 visits by each patient). At each visit, spirometry was performed repeatedly over a period of 2 hours. Patients who report improvement after the intervention did not differ significantly for the albuterol inhaler (50% improvement), placebo inhaler (45%), or sham acupuncture (46%), but the subjective improvement with all three of these interventions was significantly greater than that with the no-intervention control (21%). Another study by W. Biernacki et al⁴, found little evidence for an effect of acupuncture as a treatment for asthma. They conducted a randomized, double-blind (patient and evaluator) study in 23 non-smoking asthmatics (10 Male; 13 Female) aged 43±15 years old with forced expiratory volume in 1 second (FEV1). After initial assessment (respiratory function tests and Asthma Quality Life Questionnaire) patients were randomized to receive either ‘real’ or ‘sham’ acupuncture. The measurements were repeated within 1 hour and after 2 weeks. In their study, there were no significant changes in values of spirometry acutely nor the first 60 minutes after either type of acupuncture. Neither were there any significant differences between visits. However, despite the lack of objective functional benefit, there was a statistically significant improvement in Asthma Quality of Life Questionnaire (AQLQ) scores. This

improvement was in all domains of the questionnaire and occurred in both the real and sham treatment periods. There is another clinical study by Dias PL et al⁵, regarding that twenty patients randomly assigned to an experimental and a control group participated in a double blind study to assess the effectiveness of acupuncture in bronchial asthma, using the peak expiratory flow rate (PEFR) as an index of bronchial patency. The treated group received acupuncture therapy at traditional acupuncture points, which were Tiantu(Ren 22), Dingchuan(Extra point 17) and Lieque(Lung 7), while the control group received acupuncture treatment at placebo points. All patients in the control group showed a significant improvement in their PEFR while only 3 patients in the treated group showed an improvement. A subjective improvement and a reduction in drug dosages were observed in both groups. The study demonstrated that acupuncture has a placebo effect in bronchial asthma. Another article by Gruber et al⁶, demonstrated to show efficacy of laser acupuncture for children. This double-blind, placebo controlled, crossover study that was performed to investigate the possible protective effect of a single laser acupuncture treatment on cold dry air hyperventilation induced bronchoconstriction in 44 children and adolescents of mean age 11.9 years (range 7.5-16.7) with exercise induced asthma. Laser acupuncture was performed on real and placebo points in random order on two consecutive days. Lung function was measured before laser acupuncture, immediately after laser acupuncture (just before cold dry air challenge (CACH)), and 3 and 15 minutes after CACH. Comparison of real acupuncture with placebo acupuncture showed no significant differences in the mean maximum CACH induced decrease in forced expiratory volume in 1 second (27.2 (18.2)% Vs 23.8 (16.2)%) and maximal expiratory flow at 25% remaining vital capacity (51.6 (20.8)% Vs 44.4 (22.3)%). A

single laser acupuncture treatment offers no protection against exercise induced bronchoconstriction in pediatric and adolescent patients. There is another clinical study for asthma patients. Chu KA et al⁷, demonstrated the efficacy of acupuncture in asthma patients. They conducted a randomized, double-blind study in eighteen asthma patients with bronchodilator response more than 20% improvement of forced expiratory volume in 1 second (FEV1). They were initially randomly assigned to receive 1 performance of real acupuncture (RA) or sham acupuncture (SA) in a blinded manner. This study demonstrated that asthma patients showed immediate bronchodilating response of FEV1 after acupuncture, and a similar bronchodilator response was reproducible with repeated acupuncture. These results are full of suggestions that acupuncture treatment may result in immediate improvement of FEV1, but the degree of improvement is less than that from inhalation bronchodilator. Another article by Hong Jin Pai et al⁸, demonstrated the effects of acupuncture as an adjuvant treatment for the control of asthma. This was a randomized, controlled, crossover trial conducted at the Hospital das Clínicas da Universidade de São Paulo. A total of 74 patients with mild/moderate, persistent asthma were randomized into two therapeutic groups: Group A where 31 patients underwent 10 real weekly acupuncture sessions, followed by a three-week wash out period and 10 sham weekly acupuncture sessions. In addition, there is a Group B where 43 patients underwent 10 sham weekly acupuncture sessions followed by a three-week wash out period and 10 real weekly acupuncture sessions. After the real acupuncture treatments in Group B, there was a decrease in eosinophils and neutrophils, an increase in macrophages, and improvement in peak flow. After sham acupuncture treatments, patients experienced less coughing, wheezing, and dyspnea similarly after the real acupuncture, patients

reported less coughing, wheezing, dyspnea, and nocturnal awakening episodes. In Group A, there was less use of rescue medication. After the sham procedure, patients in Group A experienced less coughing, wheezing, dyspnea and the use of rescue medication. On the other hand after real acupuncture, these patients showed improvements in functional capacity, physical aspects, general health status and vitality. Sham acupuncture also lead to significant differences in symptoms, but these were not different from those seen with real acupuncture. Spirometry and exhaled NO levels did not show a difference between sham and real acupuncture treatments. In addition, no significant differences were demonstrated between treatments regarding the quality of life evaluation.

The summaries of Controlled Trials for Chronic Asthma are given in Table 1.

Table 1. Controlled Trials for Chronic Asthma

Study type	Design size	Sample	Number of treatments	Treatment	Outcome Measures	Conclusion
Dias et al (1982)	Double blind	20	Variable	Ren 22, Dingchuan, LU 7 vs GB 5 & 6	Lung function: PEF _R Level of medication usage	Improvement in both groups, control group better than appropriate acupuncture
Biernacki & Peake (1998)	Double blind	23	1 treatment followed by crossover	Ren 17 vs sham point on the chest wall	Lung function: FEV ₁ , FVC Medication use Quality of life questionnaire	No improvement in general well being and most immunological parameters for appropriate acupuncture
Wechsler ME et al (2011)	Double blind	46	Using a block design, four interventions repeated in two more blocks of visits (total 12 visits by each patient)	active albuterol inhaler, placebo inhaler, sham acupuncture	albuterol (20%) increase in FEV ₁ , placebo inhaler (45%), sham acupuncture (46%)	The subjective improvement with all three of these intervention. Interventions was significantly greater than that with the no intervention control (21%)
Gruber et al (2002)	Double blind	44	1 treatment followed by crossover	single laser acupuncture	Lung function: CACH, FEV ₁ Maximal Expiratory Flow and Vital Capacity	No significant differences in the mean maximum CACH, No protection against exercise induced bronchoconstriction
Pai HJ et al (2015)	Double blind	74	Group A (real acupuncture) & Group B (sham acupuncture) for 3 weeks 10 treatment and crossover	short & long acting β -2 agonists and inhaler, real & sham acupuncture	Spirometry, induced sputum cell count, exhaled nitric oxide, SF-36, Quality of life questionnaire	Spirometry and exhaled NO levels did not show a difference between sham and real acupuncture treatments, no differences on the quality of life evaluation.
Chu KA et al (2007)	Double blind	18	FEV ₁ receive 1 performance of real acupuncture or sham acupuncture	LU 7, LI 11 PC 6, ST 40, LI 4, PC 3 vs sham acupuncture	Lung function: FEV ₁ Spirometry	Immediate bronchodilating response of FEV ₁ , and bronchodilator response reproduced with acupuncture

IV. DISCUSSION

According to Asian medicine, acupuncture is an appropriate treatment for complex chronic diseases, including bronchial asthma. Each method of Asian medicine, including exercise, massage, acupuncture, and herbal therapy, is considered to restore the balance of the human body, and acupuncture is considered to be effective in the treatment of asthma in Asian medicine. There are some studies that acupuncture induce strong positive effect for asthma patients. Ae-Ran et al⁹, the case study, demonstrated that there was a significant clinical improvement in the forced expiratory volume with discontinuation of the inhaled corticosteroid, and no asthma-related complaints were reported. Takishima et al¹⁰, demonstrated that acupuncture caused a short-term reduction in airway resistance in asthma patients. Chu KA et al⁷, reported that asthma patients showed immediate bronchodilating response of FEV1 after acupuncture, and a similar bronchodilator response was reproducible with repeated acupuncture. However, the published data on this subject were controversial at first. Some studies were designed and performed to study short-term acupuncture effect on asthma and reported improvement of patients' wellbeing significantly during later years⁴, while other studies about asthma showed the acupuncture conferred statistically minimal improvements in objective and subjective symptoms, the findings of the trials for asthma as part of normal clinical practice were more complicated. Essentially in their studies, the improvements were slightly greater than sham treatments compared to those after real acupuncture. Nevertheless, they demonstrate evidence for the efficacy of appropriate acupuncture for some immunological parameters, for experiences of asthma symptoms, level of medication use and quality of life¹¹. However, there are also concerns that acupuncture for asthma may

not provide solid benefits. The patients who were given acupuncture sessions and those who received a placebo form of treatment reported no change in their asthmatic symptoms afterwards. Therefore, further properly designed clinical studies examining the use of acupuncture in asthma are extremely important and urgently needed.

V. CONCLUSIONS

Overall, some clinical trials have reported temporary relief of patient's symptoms after receiving acupuncture for asthma. And the study outcomes also demonstrate slightly positive results. But data presently in the literature do not provide sufficient support for a useful role for acupuncture in asthma management. Most acupuncturists would consider these trials as minimal help in understanding the potential role of acupuncture as it is truly practiced. Accordingly the practitioners need to be sure to mention this to the patient before treating the asthma with acupuncture. The study outcomes uphold an intimate relationship to the practice of acupuncture and also demonstrate slightly positive results. Therefore, there is no reason why study outcomes cannot be used as the validated tools to differentiate the base line and outcome measures rather than using equivocal terms such as 'slight improvement'. It is also argued by many researchers that practical acupuncture treatment trials that is left to the practitioner's judgement and the control group receives an alternative form of treatment or no treatment at all, are more useful than placebo-controlled trials because they allow acupuncture to be studied as it is actually practiced. Additionally, even though acupuncture has possible effects on the control of chronic airway inflammation, acupuncture with other medications such as albuterol may have a more positive outcome on symptom control and improvements in quality of life. This will be a good example of integrative treatment between Western and Asian medicine. In conclusion, there has been much debate and research into the effects of acupuncture on many conditions with varying outcomes; it is considered a safe treatment when it is performed by well-trained practitioners using sterile needles. For more strong evidence in future, further studies are needed which integrate both strict

research methods and good quality acupuncture treatment.

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