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Acupuncture in treatment of stable asthma

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Previous studies of acupuncture in asthma have reported conflicting results, some claiming benefit for some patients. We conducted a randomized, double-blind (patient and evaluator) study in 23 non-smoking asthmatics (10 M; 13 F) aged 43 ± 15 years with forced expiratory volume in 1 s (FEV_1) 59 ± 16% pred. 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 h and after 2 weeks. Patients were recording peak expiratory flow rate (PEFR) throughout the period of the study. After 2 weeks patients who received 'real' treatment on the first visit received 'sham' treatment and vice versa. The measurements were again repeated within 1 h and after 2 weeks. There was no improvement in any aspects of respiratory function measured after either form of acupuncture. Despite this there was a significant improvement in AQLQ and parallel reduction in the usage of bronchodilators. We concluded that in some patients acupuncture could be useful in improving quality of life and reducing the need for using bronchodilators either by having a placebo effect or that the exact site of needle puncture on the chest is unimportant.

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Introduction

Acupuncture has been used for thousands of years as a treatment for a wide range of conditions. In recent years in the West public demand for such 'alternative' therapies has been growing steadily. Many believe that acupuncture is effective in the treatment of asthma (1), but there is little published scientific data to support this view. Most published studies are based on relatively small numbers of patients and very rarely has a double-blind protocol been used (2–4). The blinding of such studies is very difficult and therefore we opted for a study design comparing what is traditionally believed to be 'active' (or 'real') acupuncture with 'sham' treatment in a double-blind (observer and evaluator) study in patients with mild to moderate asthma.

Methods

We studied a group of 10 male and 13 female patients aged 43 ± 15 years with mild to moderate asthma (Table 1). All patients were non-smokers and were in a stable condition for a 2 months run-in period to trial entry. Forced expiratory volume in 1 s (FEV_1) was 1·80 ± 0·62 l at the beginning and 1·85 ± 0·61 l at the end of this period. All patients had been demonstrated as having at least 15% improvement of FEV_1 after inhaled bronchodilators within 3 months prior to entry. All patients were receiving treatment with inhaled

TABLE 1. Patients characteristics

23 patients (10 M; 13 F)
Age (years) 43 ± 15
FEV_1 (% pred) 59 ± 16 (range 26–79)
FVC (% pred) 82 ± 14 (range 48–109)
17/23 patients with a history of nocturnal asthma
20/23 patients with a history of exercise induced asthma

β_2-agonist (dosage 0·5–20 mg daily). Most of the patients (21 out of 23) were on inhaled steroids with a dosage 0·8–2·4 mg daily. Five out of 23 patients with severe airways obstruction were on long-term inhaled steroids (dosage range 5–10 mg daily). Seven out of 23 patients were on inhaled ipratropium bromide with the dosage between 0·32 and 2 mg daily. Approval for the study was obtained from the local ethics committee and written consent was obtained from all patients. On initial visit forced expiratory spirometry (Vitalograph®) and static lung volumes (body plethysmography) were measured together with completion of an Asthma Quality of Life Questionnaire (5). Patients were then randomized to receive either 'real' or 'sham' acupuncture. For 'real' acupuncture the single point Conception vessel 17 (CV 17) (6) localized on the mid-sternum on line between the nipples was used. In contrast, for 'sham' treatment, a non-specific single point of unrecognized value on the chest wall was chosen. All our patients were given the impression that they were receiving 'real' acupuncture at all times. The acupuncture was performed with a disposable $\frac{1}{2}$ inch 30-gauge needle at an oblique angle to a depth of 1 cm and kept in situ for 20 min. Spirometry was repeated

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TABLE 2. Acute effect of the 'real' or 'sham' acupuncture

	'Real' acupuncture			'Sham' acupuncture		
		After			After	
	Initial	30 min	60 min	Initial	30 min	60 min
FEV_1 (l)	1·85 (0·61)	1·92 (0·63)	1·86 (0·59)	2·03 (0·60)	1·99 (0·53)	2·04 (0·61)
FVC (l)	3·13 (0·84)	3·24 (0·90)	3·25 (0·91)	3·29 (0·98)	3·30 (0·92)	3·37 (0·97)
FRC (l)	3·14 (1·15)		3·10 (1·02)	2·99 (1·12)		3·01 (1·17)
RV (l)	2·46 (1·12)		2·43 (1·11)	2·27 (1·03)		2·29 (1·09)
TLC (l)	5·67 (1·37)		5·74 (1·33)	5·67 (1·55)		5·77 (1·55)

All changes statistically non-significant.

30, 45 and 60 min after acupuncture with the lung volume re-measured at 60 min. A technician administered all functional measurements and the questionnaire, whereas a trained doctor (W.B.) performed the acupuncture. Patients were asked to carry on recording morning and evening peak expiratory flow rate (PEFR) measurements (best of three) using a Mini-Wright peak flow meter and to record their usage of rescue bronchodilators. PEFR recordings were analysed to derive a diurnal mean value (a.m./p.m.), average amplitude and amplitude % (7). On day 14 measurements were repeated as for day 0 and the acupuncture was repeated. On this occasion, however, patients who had received 'real' treatment on this visit received 'sham' treatment and vice versa, the order of administration being randomized. They were again asked to carry on recording PEFR and bronchodilator usage at home and to return in a further 2 weeks. On day 28 measurements were repeated but no further acupuncture was given. The dosage of all other medication was kept constant throughout the trial period. Patients who developed an exacerbation of their asthma during study were excluded from the analysis.

Statistical Methods

Data from two treatment periods were analysed by means of the Wilcoxon rank sum test and expressed as the level of significance for a two-tailed test. A value of $P<0·05$ was accepted for statistical significance.

Results

Twenty-three patients completed both periods of the study with one withdrawing following 'real' acupuncture. The withdrawal of one patient was a result of exacerbation, which was not severe. There were no significant changes in spirometric values acutely nor the first 60 min after either types of acupuncture (Table 2); neither were there any significant differences between visits (Table 3). Analysis of the home recording of PEFR also failed to demonstrate any significant changes over the period of the study (Table 4). However, despite this lack of objective functional benefit there was a statistically significant improvement in AQLQ scores (Table 5). This improvement was in all domains of the questionnaire and occurred in both the 'real' and 'sham' treatment periods. In fact the improvements were continuously slightly greater after the 'sham' treatment compared with those after 'real' acupuncture. This improvement in quality of life was accompanied by a significant reduction in the usage of rescue bronchodilators; the baseline being 1·7 ($\pm$ 2·05) mg 24 h^{-1} falling to 1·08 ($\pm$ 1·18) mg 24 h^{-1} in 2 weeks after 'real' acupuncture and to 0·83 ($\pm$ 0·85) mg 24 h^{-1} after 'sham' therapy.

Discussion

Our study has shown no improvement in any aspect of respiratory function measured after either form of acupuncture. Despite this there was a significant improvement in AQLQ scores and parallel reduction in the usage of rescue bronchodilators. We were unable to demonstrate any advantage of 'real' over 'sham' acupuncture. Rosenthall *et al.* (8) found that patients suffering from exacerbation of asthma treated in emergency rooms improved symptomatically without changes in spirometry after treatment with acupuncture. As here, Christensen *et al.* (3) demonstrated a reduced need for rescue bronchodilators after both 'real' and 'placebo' acupuncture. Although acupuncture has been shown in one study to improve methacholine-induced bronchospasm (9), this was not confirmed in a more recent

TABLE 3. Mean (SD) results of pulmonary function tests at initial visit and after 2 weeks of treatment with 'real' or 'sham' acupuncture

	Initial visit	2 weeks after 'real'	2 weeks after 'sham'
FEV_1 (l)	1·89 (0·66)	2·03 (0·60)	2·01 (0·66)
FVC (l)	3·15 (0·89)	3·33 (0·85)	3·26 (0·94)
FRC (l)	3·16 (1·10)	2·95 (1·15)	2·93 (1·23)
RV (l)	2·42 (1·06)	2·26 (1·15)	2·28 (1·11)
TLC (l)	5·57 (1·14)	5·63 (1·42)	5·64 (1·46)

All changes statistically non-significant.

TABLE 4. Mean (SD) PEFR variability at initial stage (day 1, 2 and 3) and end stage (day 12, 13 and 14) of 2-week period of treatment with either 'real' or 'sham' acupuncture

	Mean PEFR ($l\,min^{-1}$)		Average amplitude (PEFR)		Amplitude % (PEFR)	
	Initial stage	End stage	Initial stage	End stage	Initial stage	End stage
'real'	332 (76)	349 (82)	32 (25)	33 (29)	11 (10)	12 (12)
'sham'	339 (79)	342 (89)	27 (25)	28 (26)	9 (9)	9 (9)

All changes statistically non-significant.

TABLE 5. Quality of life questionnaire and dosage of rescue bronchodilators after 2 weeks of treatment with either 'real' or 'sham' acupuncture. Mean (SD)

		2 weeks after	
	Initial score	'real' acupuncture	'sham' acupuncture
Symptoms	4·19 (1·07)	4·76 (1·03) $P=0·044$	5·15 (1·20) $P=0·06$
Activities	3·87 (1·26)	4·80 (1·29) $P=0·003$	5·17 (1·35) $P=0·0005$
Emotions	3·65 (1·53)	4·82 (1·32) $P=0·001$	5·22 (1·44) $P=0·0005$
Environment	4·28 (1·58)	4·97 (1·31) $P=0·0025$	5·53 (1·50) $P=0·0005$
Total score	123 (34)	147 (35) $P=0·003$	158 (38) $P=0·005$
Rescue β_2 ($mg\,24\,h^{-1}$)	1·7 (2·05)	1·08 (1·18) $P=0·0019$	0·83 (0·85) $P=0·009$

P values (difference between initial score and 2 weeks after either 'real' or 'sham' acupuncture.

double-blind trial (10). Tashkin *et al.* (11) in a cross-over study failed to find any significant effect of acupuncture in a group of stable asthmatics but did not measure quality of life. The obvious conclusion to draw from our findings, however, is that we have seen a placebo effect. The fact that we recorded benefit after 'real' and 'sham' acupuncture could be interpreted as a placebo effect but it could also be argued that it is not necessary to utilize traditional insertion points and that any point on the chest is equally effective. Clearly the results of our study do not allow us to distinguish the mechanism of action acupuncture. We believe that acupuncture can offer additional help in treatment of mild to moderate asthma, especially in very anxious patients, by improving their quality of life and by reducing the dosage of rescue bronchodilators.

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