Peer reviewed article

Complementary and alternative medicine in asthma – do they work?

A summary and appraisal of published evidence

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Summary

Objective: An increasing number of patients with asthma are attracted by complementary and alternative medicine (CAM). Therefore, it is of importance that scientific evidence about the efficacy of this type of therapy be is regarded.

Method: We searched the electronic databases Medline, Embase and the Cochrane Library for controlled trials and systematic reviews to evaluate the evidence of the most popular alternative therapies, i.e. acupuncture, homeopathy, breathing techniques, herbal and nutritional therapies.

Results: Claims that *acupuncture* is effective for the treatment of asthma are not based on well-performed clinical trials. The role of *homeopathy* in the treatment of asthma needs further evaluation. *Breathing techniques*, e.g. improved control of breathing by yoga, may contribute to the control of asthma symptoms, but due to the small number of controlled trials and due to the small number of patients it is not possible to make firm judgments. *Herbal remedies* cannot be recommended based on the available evidence. Recommendations for a *diet* high in vitamin C and marine fatty acids are not harmful, but evidence for clinically meaningful effects are scant.

Conclusion: Up to now evidence is lacking that alternative forms of medicine are more effective than placebo in asthma. However, lack of evidence does not always mean that treatment is ineffective, but it could mean that effectiveness has not been adequately investigated. High quality research as in conventional therapy should be fostered in complementary medicine.

Key words: complementary medicine; asthma; alternative therapy

Introduction

An increasing number of patients are treated with methods of complementary and alternative medicine (CAM). Despite growing health care costs and very limited evidence of the efficacy of most CAM therapies, its use has grown substantially over the last 10 years in Europe, the United States and Australia [1–5]. Since last year five alternative methods are covered by health insurances in Switzerland, and the estimated additional costs for the health system are about CHF 350 million [6]. There is no conclusive answer as to why patients seek CAM, but it seems that they feel more empowered by the process, more actively involved in the decision making, and more in control of their illness [7–9]. Particularly patients with chronic illnesses often perceive CAM as more successful than conventional medicine.

Asthma is a frequent disease with a prevalence rate ranging from 5 to 15%. The use of CAM in asthma patients is increasing as an adjunct and also as a substitute for effective and proven therapies [10]. Hence, health care providers will be more frequently asked about the benefits of alternative therapies for asthma. It is of importance that they are informed about the efficacy and potential adverse effects of these therapies. This article summarizes the most popular alternative modalities in asthma and the evidence of their effectiveness.

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Methods

Computerized literature searches were performed to identify randomised controlled trials (RCTs) and systematic reviews on the subject. Databases including Medline, Embase and the Cochrane library were searched until May 2002. The search terms used were: asthma, complementary medicine, alternative medicine, acupuncture, homeopathy, yoga, breathing techniques and exercises, herbal medicine and nutritional therapy. The bibliographies of the retrieved studies were searched for further trials. Papers written in English and German were included. The original studies were compared with systematic reviews if available. We searched for the RCTs that were included in the reviews and those that were not, and investigated the reasons for exclusion. We also assessed how many systematic reviews existed on a particular topic and compared them regarding the included trials, available data and the conclusions. The synthesis of the data and conclusions are given as a qualitative summary.

Results

Acupuncture

Numerous uncontrolled trials assessing the use of acupuncture in the treatment of asthma, but also more than 20 controlled trials and six reviews [11–15] are available in the literature. In 1991 Kleijnen et al. published a systematic review of 13 controlled clinical trials (1963–1989) on acupuncture in asthma [11]. The studies were of rather poor quality according to predefined methodological criteria. Only studies where needles were used have been included. Studies in which only surface electrodes or laser acupuncture were applied have been excluded. The control groups consisted of patients either treated by some sort of sham procedure or / and a conventional treatment modality.

The striking features were the small number of patients (less than 30 per trial), inadequate follow-up, lack of assessment of subjective symptoms, inappropriate check of the medication used, and incomplete report on side effects. Only three of eight trials reporting a "positive" outcome were of acceptable quality. Five studies reported negative results, all were of better quality.

In an editorial to the review of Kleijnen, Lane [15] reviewed various CAM practices used in asthma. For acupuncture some benefit was observed in acute asthma, but less than that achieved with a beta-agonist. In 1994 Medici [12] came to the conclusion that short-term effects are better documented than long-term effects. Two additional reviews [13, 16] formed the basis for the 1999 Cochrane review, where the primary objective was the long-term effect of acupuncture [17]. Of 21 identified controlled clinical trials published until 1998, only seven fulfilled the inclusion criteria and were analysed. The number of patients in the seven trials included varied between 17 and 29 with a total of 174 patients. Eight studies included in the former reviews by Kleijnen [11], Lane, Medici and Jobst [12, 13, 15] were excluded. Four of these eight studies were excluded because of non randomisation [18–21] three because they dealt with exercise induced asthma [22–24] which was not addressed by the Cochrane review, and one because it dealt with the effect of acupuncture on thoracic trigger points [25]. Four studies were included in all of the mentioned reviews [26–29]. Two trials reported significant improvement of symptoms [27, 28]. One trial [27] demonstrated a statistically significant decrease of medication use after two weeks.

The Cochrane review added three more trials [30–32]. Lung function, drug use and subjective measurements were considered. However, data were presented inconsistently and assessment methods differed fundamentally, precluding a meaningful meta-analysis. In a recent RCT over six months Medici et al. did not find significant differences in lung function, symptoms and drug use in 66 patients treated with acupuncture or placebo [33]. Currently available data do not provide sufficient support to make any recommendation about acupuncture in the treatment of asthma.

Homeopathy

Homeopathy is one of the most widespread and controversial therapy of CAM [34].

The best known homoeopathic approach is "like should be cured with like" (isopathy). Although homeopathy seems scientifically implausible, three meta-analyses of controlled trials have found an effect greater than placebo in different diseases [35–37].

For allergic rhinitis a few controlled studies have been published using isopathy, also called homeopathic immunotherapy, which demonstrated symptomatic improvement, reduction in antihistamine requirements, and improvement in nasal airflow [38–40]. In a meta-analysis combining data from two studies on allergic rhinitis and one on asthma isopathy showed a significant effect on asthma, but only 28 patients with asthma were involved and the major outcome was the patient's own perception of asthma rather than measurements of lung function [41].

In 1999 Linde and Jobst published the only systematic review on homeopathy for chronic asthma in the Cochrane library [37]. Three of five retrieved trials were included in their review comprising 154 patients [41–43]. All were placebo controlled but used different homeopathic remedies. The quality of two trials appeared to be suboptimal, and due to the heterogeneity of the trials a quantitative meta-analysis was not possible.

In a three-month trial Reilly found a highly significant (p = 0.003) reduction in the severity of symptoms, but no significant difference was found for peak flow measurements [41]. In a rather low quality study by Matusiewicz [42] peak flow increased in the treatment group, while it decreased in the placebo group over the study period of six months.

The third study was in children and showed no significant difference in frequency, severity and duration of exacerbations during six months [43].

Lewith et al. evaluated in a large double blind controlled trial the efficacy of homeopathic immunotherapy on lung function and respiratory symptoms in asthmatic adults allergic to house dust mite. Two hundred and forty-two participants were given oral homeopathic immunotherapy (122 patients) or placebo (120 patients), after sixteen weeks there was no significant difference between the groups in either one of the two primary outcome variables [44].

The currently available evidence is insufficient to reliably assess the possible role of homeopathy in the treatment of asthma.

Yoga, breathing exercises and relaxation therapies

Yoga is an ancient Hindu discipline increasing the mental and physical control of the body. Yoga is taught in eight steps one of which, Pranayama, is widely believed to be helpful in asthma because it deals with control of breathing: stepwise reduction in the breathing frequency, attainment of a 1:2 ratio for the duration of inspiration and expiration, a breath holding period at the end of inspiration that is twice the length of expiration, and mental concentration on breathing. Most of the studies showing beneficial effects of yoga in asthma were short term, uncontrolled and qualitative trials, but there are four controlled trials. The first trial carried out by Nagarathna [45] was a long-term study over 54 months with fifty-three pairs of asthmatic patients matched for age, sex and severity. One from each pair was randomly selected for yoga, the other served as control. Comparison of the two groups showed a significant improvement in the number of asthma attacks per week, a reduction in the drug treatment score and a significant increase of the peak flow rate for the yoga group. The second trial published in 1990 by Singh and Tattersfield [46] is a double-blind placebo-controlled study with 22 mild asthmatics using a breathing device (Pink City lung exerciser) to learn Pranayama, and a placebo device in the control group. Complete data from 18 subjects were presented. Compared to the placebo device FEV_1 and PEFR increased and inhaler use and symptom scores decreased with the Pranayama exerciser, but the changes were not statistically significant. There was, however, a significant increase in the dose of histamine needed to provoke a 20% reduction in FEV_1. In the third study 17 students with asthma were randomly assigned to either yoga or a control group [47]. The investigators didn't know which patients were undergoing the yoga intervention over the 16 weeks. The results showed a reduction in the use of beta agonists, a difference in lung function parameters and the symptom score in the yoga group, however, the differences were not statistically significant. The short study period and a possible lack of positive attitude to yoga therapy were considered as possible explanations for the negative results. The fourth study conducted in Germany [48], randomised 36 patients with asthma into three groups (yoga breathing, physiotherapy breathing exercises, and no intervention). All patients were maintained on beta agonists. The follow up period was four months, however, the duration of the study was only three weeks. Yoga and breathing exercises both ameliorated the patients' mental state, as elucidated by questionnaires (Freiburger Persönlichkeitsinventar FPI, a multidimensional personality test; Stress-Verarbeitungsfragebogen SVF deals with coping of stress and Giessener Beschwerdebogen GBB evaluation of subjective symptoms and changing of symptoms). Only breathing exercises led to a significant improvement of lung function parameters. There is a Cochrane review [49] on breathing exercises for asthma. Fifteen of 32 retrieved trials were excluded because of non randomisation or lack of a control group. Other reasons for exclusion were using a device for breathing training, and involving patients with COPD but not asthma. The 124 patients of the five included trials received three different techniques. Considering yoga three of the above mentioned studies were considered [45, 47, 48]. One study mentioned the Buteyko breathing technique [50], another deep diaphragmatic breathing [51]. A second systematic review on breathing techniques for asthma including six RCTs [45, 46, 48, 51–53] was published by Ernst in the European Respiratory Journal [54]. It is noteworthy that the review by Ernst and the Cochrane review did not include the same RCTs, only three [47, 48, 51] of the RCTs were included in both reviews. The study of Asher [52] in the review by Ernst examined 38 children with acute asthma and showed no significant difference in lung function between the groups.

The second study not included in the Cochrane review was the previously mentioned study by Singh using a breathing device [46].

Regarding relaxation therapies (progressive muscle relaxation, autogenic training, hypnotherapy and biofeedback techniques) a systematic review was recently published with some evidence that muscular relaxation improves the lung function of patients with asthma, but no evidence is provided for any other relaxation technique [55].

Breathing techniques and muscular relaxation may have some potential, but it is not possible to make a firm judgment.

Herbal medicine

A recently published systematic review by Huntley and Ernst included seventeen randomised controlled trials on herbal remedies for asthma [56]. Six used traditional Chinese medicines, eight used traditional Indian preparations, and three used other preparations. A total of 775 asthmatics received different herbal remedies. None of the studies used the same herbal preparation.

Nine of these trials were described as double blind, the overall methodological quality was poor. Only three studies were of acceptable quality and lasted for four weeks or more, all of these used traditional Indian remedies [57–59]. Only one of these studies published in 1974 and which included 123 asthmatics showed a benefit with respect to lung function [58].

Nutritional therapies

Correlations have been observed between fresh fruit consumption and lung function, and between antioxidant vitamin intake and ventilatory function in children and adults [60–64]. Vitamin C intake was associated with lower incidence of wheezing and bronchial hyperresponsiveness in three studies [63, 65, 66], but others found no effect [67].

Low magnesium intake was speculated to play a role in asthma and COPD. Britton et al. [64] have shown that bronchial hyperreactivity is directly related to the intake of magnesium. Furthermore, high magnesium intake was associated with a reduction in wheezing [64]. Intravenous magnesium sulphate administration was believed to provide additional benefits to patients with acute asthma. However, a systematic review of seven randomised controlled trials (5 adult, 2 paediatric) involving 665 patients does not support its routine use in all patients with acute asthma presenting in the emergency department [68]. In the subgroup with severe initial airflow limitation (FEV_1 <40% predicted) admissions were reduced (odds ratio 0.10, 95% confidence interval 0.04 to 0.27). Another randomised trial not included in the Cochrane review with 54 moderate to severely ill children showed no additional benefit of intravenous magnesium sulphate as an adjunct to initial treatment with albuterol and corticosteroids [69].

Epidemiological studies suggest that a diet with a high content in marine fatty acids (fish oil) may have beneficial effects on inflammatory conditions [70]. A Cochrane review by Woods et al. determined the effect of fish oil supplementation in asthma [71]. Eight RCTs conducted between 1986 and 1998 were included [72–79]. Seven compared fish oil with placebo and one high dose versus low dose supplementation. All except one were in adults [75]. A total of 158 patients were included in these eight studies. None of the studies reported asthma exacerbations, health status or hospital admissions. Analysable outcomes were FEV_1, peak flow rate, asthma symptoms, asthma medications or bronchial hyperreactivity. There was no consistent effect on any of these outcome parameters. The single study in children showed improved peak flow and reduced need for asthma medication.

Another randomised controlled study in 29 Japanese children not included in the Cochrane review showed significantly reduced asthma symptom scores and decreased bronchial reactivity in the fish oil treated children [80].

Caffeine is chemically related to theophylline and shows weak bronchodilator effects [81]. Being found in coffee, tea and cola flavoured soft drinks, caffeine is widely consumed throughout the world. Accordingly, interest has been raised in its potential as an asthma treatment. A Cochrane review systematically examined and summarized the evidence [82]. Six trials involving 55 adults with mild to moderate asthma were included. A modest clinical improvement in lung function parameters was seen with caffeine compared to placebo for up to four hours after ingestion. Whether this effect is of clinical relevance could not be assessed with the trial data presented.

Discussion

According to the recently published results of a survey [5] in the United States a large proportion of the population uses CAM, and the data suggest an increasing demand for these therapies. Also a lot of patients with asthma are interested in and seek help from alternative and complementary medicine. Data from the United Kingdom demonstrated that only 41% of patients with asthma had never tried CAM, and that 67% are considering its use for their asthma in the future [10] Patients obtained information about CAM primarily from friends and the media, and not from doctors. This may reflect that physicians are not open-minded towards these therapies or that their knowledge of them is scant. There is a reasonable volume of research on the use of alternative therapies in asthma. Although the usefulness of CAM is not proven by data, physicians should be able to advise their patients on their use.

Contrary to most narrative reviews where the connection between clinical recommendations and evidence is often tenuous we tried to assemble the best available evidence in the present qualitative summary.

According to the published literature breathing techniques, including yoga, are the most promising alternative forms of CAM for asthmatics. Patients perceive breathing techniques as a useful

Table 1
Overview of the published evidence for popular complementary and alternative medicine (CAM) in asthma.

CAM	RCTs	systematic reviews and number of RCTs included	total number of patients	number of studies with acceptable quality results in favor		comments
				yes	no	
Acupuncture	18	Linde [17] 7	174	2	5	Inconsistent results. Trend in decrease of medication use, statistical comparison of lung function only possible for 3 trials, with no effect in chronic asthma.
		Kleijnen [11] 13	230	3	5	
		Lane [15] 13	244	4	5	
		Jobst [85] 16	320	4	4	
		Medici [12] 13	230	3	5	
Homeopathy	6	Linde [37] 3	396	1	2	High heterogeneity, meta-analysis not possible.
Breathing techniques and relaxation	15	Holloway [49] 5	236	2	3	Benefit in isolated outcome measures in single studies. Meta-analysis not possible
		Ernst [54] 6	219	2	4	
		Huntley [55] 9	536	1	5	
Herbal therapy	17	Huntley [56] 17	1379	1	2	Most trials with significant methodological flaws, different remedies and preparations.

and effective form of CAM [10, 49, 54]. Improved control of breathing by yoga or breathing exercises may contribute to the control of asthma. Pranayama breathing has also been shown to be protective against histamine challenge [53]. Enthusiasm for acupuncture in asthma treatment seems to be growing, but appraised critically, data are not convincing [11, 17]. The same is true for homeopathy and in particular for herbal therapies [37, 56]. Common features of all publications on these techniques were the small trial sizes and inconsistent presentation of lung function or subjective parameters (table 1).

Appropriate management of patients with asthma ameliorates their symptoms and reduces the rate of severe exacerbations [83, 84]. Modern pharmacotherapy increases patients' quality of life, reduces the number of days of sick leave and the frequency of hospitalisations. Considering the limited resources in every health care system doctors should prescribe drugs or order therapies that are safe and cost-effective. There remains a need for larger and better designed studies about CAM to answer some important questions. First, are the recorded benefits of clinical relevance? Second, how safe are these therapies; and third, if alternative techniques are effective, how do they work? The same standards of efficacy and safety as for conventional treatment should be warranted for alternative therapies. Until more evidence is available, it is premature to recommend any alternative treatment as more than a potential adjunct to conventional treatment in patients with asthma.

Conclusions

At present there is inadequate proof that most alternative forms of medicine are more effective than placebo in asthma. Interesting questions remain unanswered. However, it is important to note that lack of evidence does not always signify that treatment is ineffective, but it could mean that effectiveness has not been investigated by appropriate methods.

Increasing numbers of patients with asthma wish to use CAM with or instead of conventional medical treatment, and therefore doctors should be informed about these therapies.

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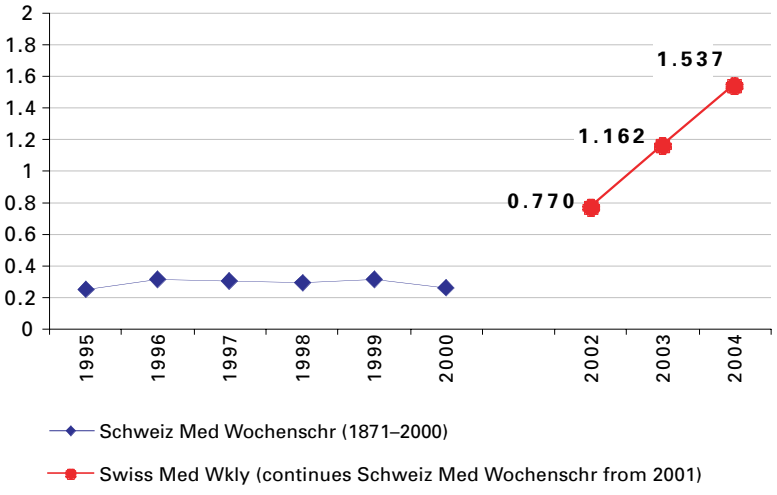

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