

**Manual therapy in the management of asthma:
a summary of recent relevant research (September 2018)**

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Key messages:

- Patient-rated measures such as quality of life, medication use, anxiety and exertion appear to improve irrespective of therapeutic modality.
- Objective spirometric measurements of asthmatic lung function are widely used, although one study challenges their correlation with asthma severity and symptoms.
- Favourable changes in spirometric measures are usually seen in smaller, lower-quality studies.
- Where larger, controlled trials find positive effects, these effects are usually seen in both intervention and control groups, suggesting a placebo effect.
- The lack of a validated sham treatment is highlighted by several studies.
- Published research on manual therapies in the treatment and management of asthma in adults and children is limited, and is of variable quality.

CONTEXT

This article is intended to give a brief overview of predominantly manual therapy and osteopathic-relevant research, with references provided for further reading. It is not intended to be an exhaustive account of the literature.

Manual therapy in the management of asthma

Asthma is a common, complex chronic disorder of the airways that is characterised by “variable and recurring symptoms, airflow obstruction, bronchial hyper-responsiveness, and an underlying inflammation” (Bronfort *et al.*, 2001). The diagnosis is made through the combination of the patient’s history, upper respiratory physical exam, and pulmonary function testing (spirometry) (Bronfort *et al.*, 2010).

Between 8% and 9% of the UK population suffers from asthma, with children being predominantly affected (Asthma UK, 2018). Patients may seek complementary and alternative therapies before consulting biomedical practitioners (George and Topaz, 2013).

This summary was based on existing published systematic reviews, Clinical Knowledge Summaries (CKS), and National Institute for Health and Care Excellence (NICE) guidelines. Additionally, several papers were identified during a separate systematic review, and were recommended by the authors of that review (Carnes *et al.*, 2018).

In total 6 systematic reviews were identified: Alcantara *et al.* (2012); Bruurs *et al.* (2013); Ferrance and Miller (2010); Gieberzon *et al.* (2012); Pepino *et al.* (2013); Posadzki, Lee and Ernst (2013).

Characteristics of the studies

Published research on the effectiveness of manual therapy for the treatment of asthma is limited and, the reviewed papers overlapped significantly.

A total of three randomised controlled trials (RCTs) examined chiropractic treatment: two of them (Balon *et al.*, 1998; Bronfort, 2001) were discussed in all four reviews on chiropractic (Alcantara *et al.*, 2012; Ferrance and Miller, 2010; Gieberzon *et al.*, 2012; Pepino *et al.*, 2013), and the other one (Nielsen *et al.*, 1995) in two of them (Alcantara *et al.*, 2012; Ferrance and Miller, 2010).

Only one RCT (Guiney *et al.*, 2005) evaluated effectiveness of osteopathy. It was covered by both reviews of this treatment modality (Pepino *et al.*, 2013; Posadzki, Lee and Ernst, 2013). The only additional research article (Brady, 2010), included by Posadzki, Lee and Ernst (2013), is an abstract from a conference, thus challenging to evaluate.

The management of asthma by physiotherapy was covered by only one review (Bruurs *et al.*, 2013), and massage was explored by Pepino *et al.* (2013) based on only two primary research articles.

Major characteristics of the studies are shown in table 1 below.

Table 1: Major characteristics of the studies

Reference	Treatment Modality	Patients	Studies
Alcantara <i>et al.</i> , 2012	chiropractic	all ages	3 RCT; 10 case reports ; 3 case series ; 7 cohort studies ; 3 surveys ; 5 commentaries ; 6 systematic reviews
Ferrance and Miller, 2010	chiropractic	children	3 RCT; 2 case reports
Gleberzon <i>et al.</i> , 2012	chiropractic	children	2 RCT
Posadzki, Lee and Ernst, 2013	osteopathy	children	2 RCT (1 available as abstract from conference only)
Bruurs <i>et al.</i> , 2013.	physiotherapy (breathing exercises, inspiratory muscle training, physical training and airway clearance)	all ages	21 RCTs
Pepino <i>et al.</i> , 2013	massage, osteopathy and chiropractic	children	5 RCTs: 2 massage; 2 chiropractic; 1 osteopathy

Subjective and objective measures

Trials used combinations of objective spirometric measures, and subjective measures including medication use, asthma symptoms, exertion, quality of life, treatment satisfaction and anxiety for children/parents. Results differed between RCTs and smaller studies.

In almost all the RCTs reviewed, except for Nielsen *et al.* (1995) and Brady *et al.* (2010), patient-rated measures (quality of life, use of medication, decreased symptoms, asthma severity) improved. In contrast, lung function results (measured by forced vital capacity, FVC, or forced expiratory volume, FEV) were unaffected by treatment, except in two RCTs: VO₂max was raised by physical training in children (Bruurs *et al.*, 2013) and peak expiratory flow (PEF) increased following osteopathic treatment (Guiney *et al.*, 2005).

In the smaller studies, objective and subjective outcomes were generally improved: symptom severity and medication use decreased, and quality of life was reported to improve. Spirometric readings also improved in some studies (Alcantara *et al.*, 2012; Ferrance and Miller, 2010)

Discussion

Quality assessment of the studies

Posadzki, Lee and Ernst (2013) commented on the general low quality of studies, highlighting the challenges inherent in assessing quality. When quality assessment scoring systems were used by the reviewers, they assessed different parameters that led to different ratings.

Alcantara *et al.* (2012) commented that some "quality scoring[s] ... are potentially misleading" due to study design issues including the lack of validated shams. The overall the level of evidence reported is mixed.

Choice of control

The choice of a credible control in controlled studies is a challenge (Posadzki, Lee and Ernst, 2013). Alcantara *et al.* (2012) note that in the 3 chiropractic RCTs (Bronfort, 2001; Balon, 1998 ; Nielsen, 1995) the sham spinal manipulation technique used was not adequately validated, and suggested it may have produced an active effect. Pepino *et al.* (2013) expressed similar concerns regarding massage applied to control groups.

Mechanism of action of manual treatment

Although manual treatment does not appear to influence lung function, it positively affects the quality of life of patients. Several authors look beyond the pulmonary features of asthma, and explore further mechanisms of action. Alcantara *et al.* (2012) describe endocrine and immune impairments in asthmatic patients, such as elevated immunoglobulins (IgE, IgA) and cortisol levels. Ferrance and Miller (2010) link asthma to allergic diseases, and point to the increased IgE levels. Alcantara *et al.*, 2012, and Pepino *et al.*, 2013, suggest that manual therapies may usefully target these mechanisms.

The musculoskeletal consequences of asthma including compromised posture, use of accessory breathing muscles and impaired thoracic mechanics, are described in several reviews (Alcantara

et al., 2012; Pepino *et al.*, 2013; Gleberzon *et al.*, 2012 ; Ferrance and Miller, 2010). According to Alcantara *et al.* (2012) and Pepino *et al.* (2013) addressing these may improve the patient's global condition and quality of life.

The use of objective outcomes linked exclusively to lung function (spirometry) is questioned by Alcantara *et al.* (2012). Bruurs *et al.* (2013) note the increased emphasis on subjective outcomes in more recent studies, and Gleberzon *et al.* (2012) recommend this approach for future studies.

Limitations of the studies

The reviews were based on a small number of research papers, reporting trials of variable quality. The need for better-designed trials was a consistent recommendation. Common limitations included lack of validated sham treatment, small sample sizes, poor methodology description, variability of outcomes measured and measurement methods.

Bronfort report

In 2010, Bronfort *et al.* published their wide-ranging review "Effectiveness of Manual Therapies: the UK evidence report". Bronfort *et al.* (2010) reached the following conclusions regarding manual therapies in the treatment and management of asthma:

- "Spinal manipulation is not effective for asthma... when compared to sham manipulation" in adults or children (page 26).
- Regarding massage for children, "the evidence is inconclusive for asthma" (page 26).
- Where clinically important changes occur in trials, they occur in both the active and sham treatment groups (page 19).

In defining their quality grading system, Bronfort *et al.* (2010) refer to the "direction of the observed effect". They find that there is "inconclusive evidence [i.e. low quality] in a favorable direction regarding the effectiveness of osteopathic manipulative treatment for change in asthma symptoms and lung function in children" (page 19).

While writing this Snapshot Summary, we found no new relevant primary research published since the Bronfort report.

Conclusion

Assessing the effectiveness of manual therapy for asthma raises a number of significant challenges, and the results are not clear. Although there does not seem to be evidence that manual therapy improves lung function, several authors speculate on the mechanisms of action that might explain favourable changes seen in several measures, both qualitative and quantitative. Validated sham interventions and sub-grouping of patients may offer means to explore these changes, and most reviewers consistently call for further research.

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