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Does The Use Of Fascial Manipulative Therapy Help To Improve Overall Asthma Quality Of Life By Decreasing Asthma Symptoms?

Christie Mecouch, PA-S

A SELECTIVE EVIDENCE BASED MEDICINE REVIEW

In Partial Fulfillment of the Requirements For

The Degree of Master of Science

In

Health Sciences – Physician Assistant

Department of Physician Assistant Studies
Philadelphia College of Osteopathic Medicine
Philadelphia, Pennsylvania

December 20, 2013
ABSTRACT

Objective: The objective of this selective EBM review is to determine whether or not the use of fascial manipulative therapy helps to improve overall asthma quality of life by decreasing asthma symptoms.

Study Design: Review of two randomized controlled trials (RCTs) and one case study, published between 2005-current, all in the English language.

Data Sources: Two randomized controlled trials (RCTs) and one case study, all of which evaluate the effectiveness of fascial manipulative therapy as it pertains to asthma quality of life. All studies were found using PubMed.

Outcomes Measured: The outcomes measured were an improvement of asthma quality of life pertaining to asthma symptoms. These improvements were based on verbal reports given by patients and/or guardians, asthma quality of life questionnaires, and PFTs related to morbidity and mortality.

Results: The RCT by Mehl-Madrona et al. and the case study by Gillespie both demonstrate that the use of fascial manipulation therapy help to improve asthma quality of life by decreasing asthma symptoms. While Guiney et al. did not demonstrate a decrease in morbidity and mortality associated with an increase in PFTs, the study does report patients “feeling better” after receiving fascial manipulation therapy.

Conclusions: The results of this review demonstrate that there is evidence to support that the use of fascial manipulation therapy can improve overall asthma quality of life by helping to decrease asthma symptoms. While there was no documented decrease in morbidity and mortality, all three studies showed that the use of fascial manipulation therapy, such as craniosacral and myofascial release Osteopathic Manipulative Treatment (OMT), can release myofascial tension and help patients to “breathe better”.

Key Words: Asthma, Manipulation Therapy
INTRODUCTION

Asthma is a chronic inflammatory disorder of the lungs. An asthma attack is characterized by inflammation leading to reversible obstruction of the airways, resulting in a difficulty in breathing.\(^4\) In 2011, the Center for Disease Control and Prevention reported that in the US alone there were approximately 18.9 million adults and 7.1 million children living with asthma.\(^6\) These numbers account for 8.2% of the total adult population and 9.5% of the total children population.\(^6\) In 2010 the CDC reported that 14.2 million Americans visited their primary care physician office with asthma as their primary diagnosis and another 1.8 million Americans visited the emergency department with asthma as their primary diagnosis.\(^6\) With the number of medical visits for asthma related complaints it is not surprising that asthma has an estimated annual healthcare cost of $56.0 billion.\(^5\)

The severity of asthma varies from patient to patient. Asthma can range from mild to severe and life threatening, leading to death if not promptly and properly dealt with. The strongest predisposing factor of asthma is atopy, a genetic disposition to develop an allergic reaction. Common allergens, prone to triggering an asthma attack, include house dust mites, cockroaches, animal dander, seasonal pollens, and cigarette smoke.\(^4\) An asthma attack can be initiated by either extrinsic, allergic, or intrinsic, non-allergic, factors. Exposure to such factors leads to airway inflammation by a variety of mechanisms including: cellular infiltration by eosinophils, neutrophils and lymphocytes; goblet cell hyperplasia leading to an increase in mucus production; thickening of the basement membrane due to collagen deposition; hypertrophy of bronchial smooth.\(^4\) All such mechanisms cause a narrowing of the airways leading to classic symptoms such as wheezing, dyspnea, chest tightness, coughing, and excess sputum production.\(^4\)
Conventional asthma treatment is based on the severity of a patient’s asthma and involves the use of various types of pharmacologic agents to reduce inflammation and control asthma symptoms. Quick-relief medications for acute asthma exacerbations include inhaled short-acting beta-2-agonists and anticholinergics. Long-term control medications intended for better overall control of asthma include systemic corticosteroids, inhaled long-acting beta-2-agonists, inhaled long-acting anticholinergics, leukotriene modifiers, phosphodiesterase inhibitors, immunomodulators, and combination medications.

While there is currently no cure for asthma, all of the above listed medications have been demonstrated to help control asthma by reducing symptoms. Nevertheless, there is still a pursuit for an intervention that will help to further reduce asthma symptoms without the use of pharmacologic agents. This paper evaluates two randomized controlled trials and one case study in determining the efficacy of fascial manipulative therapy in improving asthma quality of life by decreasing asthma symptoms. The term fascial manipulative therapy encompasses osteopathic manipulative (OM) techniques including rib raising, muscle energy for ribs, myofascial release, and craniosacral therapy (CST). Andrew Taylor Still, M.D., D.O. founded osteopathic medicine in the 19th century on the basis that there is a myofascial system that links all parts of the body. Andrew Taylor Still developed techniques which involved manipulation of the myofascial system to “improve circulation and correct altered mechanics” of the body to treat illness and disease. Osteopathic manipulative treatment (OMT) has long been used by osteopathic doctors to provide relief for muscle aches and pains with the use of stretching, gentle pressure, and resistance. These techniques are now being used for trial with other health problems such as asthma, carpal tunnel syndrome, and migraines, among others, to complement or even replace pharmacological agents and surgery.
OBJECTIVE

The objective of this selective EBM review is to determine whether or not the use of fascial manipulative therapy helps to improve overall asthma quality of life by decreasing asthma symptoms.

METHODS

This review includes two randomized controlled trials (RCTs) and one case study, all of which evaluate the effectiveness of fascial manipulative therapy as it pertains to asthma quality of life. The population studied includes males and females ages 5-80 years old who have been previously diagnosed with asthma. The interventions used were OMT techniques that included craniosacral therapy and myofascial release therapy. Mehl-Madrona et al. used 12 sessions lasting 45 minutes each over a six week period of craniosacral therapy. Guiney et al. used Osteopathic manipulative treatment (OMT) including rib raising, muscle energy for ribs, and myofascial release. Gillespie used craniosacral fascial therapy at seven one-hour visits during which the diaphragm, lungs, tracheobronchial tree, throat, neck, cranium, and nasal sinuses were manipulated to relieve soft tissue strain and free the respiratory system. The comparisons studied included prior use of standard asthma medications such as anti-inflammatory drugs (corticosteroids) and bronchodilators, as well as comparison to “sham procedures” performed by allopathic physicians to account for a “therapeutic touch” variable. Measured outcomes comprised of improvement of asthma quality of life as reported by participants and also a possible decrease in asthma related morbidity and mortality rates as measured by increased pulmonary function.
<table>
<thead>
<tr>
<th>Study</th>
<th>Type</th>
<th># Pts</th>
<th>Age (yrs)</th>
<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
<th>W/D</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gillespie, 2008 (1)</td>
<td>Case  Study</td>
<td>1</td>
<td>9 y/o</td>
<td>9 y/o Caucasian boy with a primary diagnosis of advanced asthma</td>
<td>N/A</td>
<td>0</td>
<td>Craniosacral fascial therapy: Seven one-hour visits during which the diaphragm, lungs, tracheobronchial tree, throat, neck, cranium, and nasal sinuses were manipulated to relieve soft tissue strain and free the respiratory system.</td>
</tr>
<tr>
<td>Guiney, 2005 (2)</td>
<td>RCT</td>
<td>140</td>
<td>5-17 y/o</td>
<td>Asthmatic children of African American or Hispanic race between the ages of 5 and 17 years old selected from the pediatric asthma clinic of Peninsula Hospital Center in Far Rockaway, NY.</td>
<td>Patients in acute distress; Patients who demonstrated a lack of cooperation with study protocols – or were otherwise unable to participate in measuring PEF; older than 18 y/o or younger than 4 y/o</td>
<td>0</td>
<td>Osteopathic manipulative treatment (OMT) including rib raising, muscle energy for ribs, and myofascial release VS. “Sham procedure” performed by an allopathic physician simulating OMT in order to control for a “therapeutic touch” variable.</td>
</tr>
<tr>
<td>Mehl-Madrona, 2007 (3)</td>
<td>RCT</td>
<td>89</td>
<td>20-80 y/o</td>
<td>Meet the criteria for diagnosis of asthma as defined by the National Heart, Lung, and Blood Institute National Asthma Education and Prevention Program; Class II through IV asthma sufferers were included</td>
<td>Under 18 y/o; acupuncture or craniosacral therapy in past 6 months; pregnant; on steroids unrelated to asthma; diagnosis of only mild intermittent asthma; life-threatening conditions</td>
<td>21</td>
<td>12 sessions lasting 45 minutes each over a six week period of craniosacral therapy vs. attention control or standard of care control.</td>
</tr>
</tbody>
</table>
Keywords used in the searches were “asthma” and “manipulation therapy”. All articles were published in peer-reviewed journals and in the English language. The articles were researched via PubMed and selected based on their relevance to my clinical question and if they included patient oriented outcomes.

Inclusion criteria included: studies were randomized controlled trials or case studies published between 2005-current, patients between the ages of 5-80 years old with a previous diagnosis of asthma as defined by the National Heart, Lung, and Blood Institute National Asthma Education and Prevention Program. Exclusion criteria included: patients ages <5 years old or >80 years old, patients in acute distress, patients involved in other research studies, who were pregnant, taking steroids unrelated to asthma, or subjects with life-threatening conditions or serious psychiatric conditions that would interfere with their ability to participate in the study and follow-up period. Summary statistics were reported using p-value and t-test.

OUTCOMES MEASURED

The outcomes measured an improvement of asthma quality of life pertaining to asthma symptoms. Gillespie measured an improvement of asthma quality of life based on reports by the patient and patient’s mother relating to an improvement in symptoms and a decrease in frequency of asthma attacks. Mehl-Madrona et al. measured outcomes using an asthma quality of life questionnaire and a medication form which the patient reported the name, dose, and frequency of medication use. The asthma quality of life questionnaires were analyzed using independent samples t tests, difference scores comparing pretreatment baseline, posttreatment, 3-month follow-up, and 6-month follow-up. One-way analysis of variance was then performed with post hoc tests with P values adjusted by Schade correction for multiple comparisons.
Guiney et al. used patient’s symptoms in correlation with PEFs to estimate pulmonary function as a predictor of asthma related morbidity and mortality.

RESULTS

Results from two randomized controlled trials and one case study are evaluated in this review. The demographics and characteristics of the three studies reviewed are displayed in Table 1. All three studies contained continuous data that could not be converted to dichotomous format. Test statistics reported by the authors include p-values, mean changes from baseline, difference scores, independent t-tests, and one-way analysis of variance with post hoc tests with P values adjusted by the Schade correction for multiple comparisons.

In the case study by Gillespie¹, a nine-year-old Caucasian boy presented with a known diagnosis of asthma. Since the age of two months old the participant had been on various regiments for asthma treatment including albuterol, levalbuterol hydrochloride, cromolyn, fluticasone propionate and salmeterol, montelukast, and prednisone.¹ The intervention in this case study was seven one-hour visits consisting of craniosacral fascial therapy to release craniosacral and fascial strains to improve asthma symptoms over a 30 day period.¹ In this study the patient was compliant with the treatment schedule outlined and developed no adverse effects from treatment. Both the patient and the patient’s mother reported improvement of asthma symptoms verbally. After only one treatment session the patient reported being able to “breathe more freely” and the patient’s mother stated that the boy was more verbally active the day after treatment.¹ At the third visit the patient’s mother stated that she had stopped the all asthma medication after the first visit and that the child had not needed to take any of his prescribed medication due to asthma symptoms in the past two weeks.¹ After the fourth visit the mother reports that the cough the child normally develops in the middle of winter was gone despite the
fact the child remained off of his asthma medications.\textsuperscript{1} By the end of the 30 day treatment period the patient’s mother reported that the child was still off of his medications, was cough free, and was able to play football outside on one of the coldest days of winter without developing asthma symptoms.\textsuperscript{1}

The RCT by Mehl-Madrona et al.\textsuperscript{3} assessed the effects of craniosacral therapy on asthma quality of life. The intervention involved 12 standard craniosacral therapy treatments, each treatment lasted approximately 45 minutes, over a six week period.\textsuperscript{3} There were a total of 89 participants in the study. The number of participants at the end of the study was 68, accounting for a 24% loss.\textsuperscript{3} No participant dropped out of the study due to adverse effects from the treatment. No adverse effects were reported by any participant in the entire study.\textsuperscript{3} A modified intention to treat analysis was used. If a participant completed one treatment and then withdrew from the study they were invited back to have a posttreatment analysis, otherwise they were not included in the final results analysis.\textsuperscript{3} The craniosacral therapy treatment group was compared to two control groups: a standard of care control group in which participants were instructed to maintain their normal asthma care regimens and an attention control group in which participants received six sessions of sham craniosacral therapy and six one-on-one educational classes. Due to the small group sizes at the end of the study the groups were collapsed into “treatment” and “control” groups for analysis purposes.\textsuperscript{3} Asthma quality of life questionnaires were completed by each participant on four occasions: pretreatment, post-treatment, a three-month follow-up, and a six-month follow-up. Asthma quality of life questionnaire mean scores for the treatment and control groups are displayed in Table 2. Difference scores were calculated to reduce within-subjects variance. There are statistically significant differences between the control and treatment groups when comparing asthma quality of life pretreatment and posttreatment scores (Table 2).
With the confidence interval set at 95% the greatest variance was noted between the difference score pretreatment and post-treatment with a mean difference of 3.61 and a P value of 0.004 (Table 2). Although not as ample as the immediate post-treatment score, the three month follow-up still displays a statistically significant difference.

**Table 2: Mehl-Madrona et al:** Comparisons of Means Between Asthma Quality of Life (part 1) Scores and Difference Scores From Baseline Across Assessment Periods

<table>
<thead>
<tr>
<th>Group</th>
<th>ADDQOL Baseline</th>
<th>ADDQOL Posttreatment</th>
<th>ADDQOL 3 Mo Posttreatment</th>
<th>ADDQOL 6 Mo Posttreatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
<td>4.77</td>
<td>5.84</td>
<td>4.41</td>
<td>3.91</td>
</tr>
<tr>
<td>SD</td>
<td>±3.91</td>
<td>±4.70</td>
<td>±4.26</td>
<td>±4.52</td>
</tr>
<tr>
<td>Active treatment</td>
<td>6.45</td>
<td>3.71</td>
<td>3.63</td>
<td>3.51</td>
</tr>
<tr>
<td>SD</td>
<td>±4.57</td>
<td>3.52</td>
<td>3.68</td>
<td>4.20</td>
</tr>
<tr>
<td>T</td>
<td>1.48</td>
<td>1.39</td>
<td>0.74</td>
<td>0.27</td>
</tr>
<tr>
<td>P value</td>
<td>0.142</td>
<td>0.083</td>
<td>0.459</td>
<td>0.789</td>
</tr>
<tr>
<td>Mean difference</td>
<td>1.88</td>
<td>1.93</td>
<td>0.78</td>
<td>0.30</td>
</tr>
<tr>
<td>95% CI</td>
<td>-3.86 to 3.35</td>
<td>-3.06 to -1.11</td>
<td>-2.87 to 1.31</td>
<td>-2.53 to 1.93</td>
</tr>
</tbody>
</table>

The RCT by Guiney et al. evaluated the effects of osteopathic manipulative treatment (OMT) on pediatric patients with asthma. This study contained 140 participants, all of which remained in the study until its conclusion. The participants were divided into two groups: 90 were placed in the OMT group and 50 were placed in the control group. Guiney et al. postulated that OMT may be a treatment method to help decrease asthma related morbidity and mortality in pediatric patients. Guiney et al. measured PEFs to estimate pulmonary function as an indirect
measure of morbidity and mortality. The treatment group received OMT, which included rib raisings; muscle energy for ribs, and myofascial release while the control group received a sham procedure performed by an allopathic physician. PEFs were measured before and after the OMT or sham procedure. Results were then analyzed using t tests (Table 3). Based on osteopathic principles, the use of OMT can be used to maximize the motion of the musculoskeletal system which improves the overall function of the respiratory system and allows the patient to breathe better. The use of OMT was able to increase pulmonary function with a mean of 13 L per minute and percent difference of 4.8% in PEFs compared to the control group which had a mean increase of 0.3 L per minute in pulmonary function and a percent difference of 1.4% in PEFs (Table 3). There was a positive correlation noted between the increase in pulmonary function and the patients “feeling better.” However, there was no demonstration of a significant decrease in morbidity and mortality. The authors suggest that further testing with a larger sample size and long-term follow up is needed.

Table 3: Guiney et al.: Peak Expiratory Flow Rates for Pediatric Patients with Asthma

Summary of t Test Analysis (Liters Per Minute)

<table>
<thead>
<tr>
<th>Group</th>
<th>Difference</th>
<th>Percent Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteopathic Manipulative Treatment (n=50)</td>
<td>13.0 (7.3 to 18.7)</td>
<td>4.8 (2.7 to 6.9)</td>
</tr>
<tr>
<td>Control (n=50)</td>
<td>0.3 (–9.8 to 10.4)</td>
<td>1.4 (–1.8 to 4.5)</td>
</tr>
</tbody>
</table>

* CI indicates confidence interval.
DISCUSSION

This systemic review investigated the effectiveness of fascial manipulation therapy, such as OMT, on asthma quality of life as demonstrated in two RCTs and one case study. The case study by Gillespie and the RCT by Guiney et al evaluated pediatric patients with asthma over the age of 5 years old. The remaining RCT by Mehl-Madrona et al evaluated adult patients with asthma between the ages of 20 and 80 years old. Each of the three studies described a positive correlation between fascial manipulation therapy and improvement of asthma quality of life.

A limitation of this literature review is that it involved search parameters that only included publications from 2005 to January 2013, which excluded any prior publications. Each of the included studies had their own limitations. The case study by Gillespie, while it demonstrated a profound relationship between the use of craniosacral therapy as an effective approach to improving asthma symptoms, only contained a sample size of one. Further research is needed in order to determine a more definitive relationship.

Guiney et al. contained participants that were selected from the pediatric asthma clinic of Peninsula Hospital Center in Far Rockaway, NY. A sample size containing a wider population distribution may help to strengthen the validity of the results. Another limitation in the RCT by Guiney et al. is that the study only included one session of either OMT or the sham procedure. Therefore, the study was unable to assess long-term treatment effects.

Mehl-Madrona et al. contained a moderately high dropout rate, 24% lost, which is source of potential bias. Mehl-Madrona et al. also had an unforeseeable and uncontrollable situation that may have affected the outcomes. This situation was the fact that the 9/11 attacks occurred in the middle of the intervention period of the study. Because environmental factors can play a
significant role in asthma symptoms, the increased levels of smoke and dust from the 9/11 attacks may have altered the results.

Osteopathic manipulation treatment (OMT), which includes techniques such as craniosacral therapy and myofascial release, has been in use since the 19th century. While OMT is classically known for its treatment of low back pain and musculoskeletal abnormalities, according to the American Osteopathic Association, OMT can also be used in the treatment of asthma, carpal tunnel syndrome, menstrual pain, sinus disorders, and migraines. The American Osteopathic Association also reports that OMT is covered by most insurance plans.

CONCLUSIONS

Asthma is a chronic condition that may range from only mild symptoms to deadly attacks. With 16 million Americans visiting either their primary care physician or an emergency department in 2010 due to a chief complaint of asthma related symptoms and an estimated annual healthcare cost of $56.0 billion, it is clear that further intervention is required in order to help improve their asthma quality of life. The results of this review demonstrate that there is evidence to support that the use of fascial manipulation therapy can improve overall asthma quality of life by helping to decrease asthma symptoms. While there was no documented decrease in morbidity and mortality, all three studies showed that the use of fascial manipulation therapy, such as craniosacral and myofascial release OMT, can release myofascial tension and help patients to “breathe better”. As mentioned in Guiney et al. future studies may benefit from the use of a single osteopathic physician performing OMT in order to eliminate potential differences in OMT skill levels and techniques.
References


5. American Lung Association Epidemiology and Statistics Unit Research and Health Education Division. Trends in asthma morbidity and mortality.  

