The Relationship Between OMT and Focused Breath Work

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Introduction

The osteopathic tenets include recognizing the inherent relationship between structure and function, the two being reciprocally related, meaning that either one can influence the other rather than a unidirectional relationship. The *structure* of the lungs, diaphragms, thoracic cage, and surrounding vertebrae and muscles produces the *function* of respiration. Osteopathic manipulative treatment (OMT) has been shown to improve the functionality of breathing (Seffinger *et al*.). Additionally, breathing exercises have been implemented in improving the functionality of the respiratory system, including those with respiratory disease such as COPD (Dellweg *et al*.). However, more research needs to be conducted in examining a possible synergistic relationship between OMT and breathing exercises. The goal of this pilot study is to estimate effect sizes and compare the variable outcomes in the data to aid in design of future large-scale crossover studies. Such studies are needed to determine if OMT and breathing exercises combined shows significant improvement in somatic dysfunction, thoracic ROM, and peak flow meter results compared to OMT or breathing alone.

Methods

Research Design

Over the course of a 6-week period, data was collected from 35 subjects at the preliminary meeting and each subsequent 2-week meeting. Subjects were randomly assigned to one of three groups (A, B, and C) and baseline data points, including osteopathic evaluation and respiratory measurements, were collected. For a 2-week block, Group A received generalized osteopathic treatment (GOT) on the axial skeleton, Group B began breathing exercises (BE) three days a week, and Group C received both GOT and performed the BE. At the end of the 2-week block the measurements were taken and the subjects switched treatments. The protocol repeated 3 times until all the subjects received all forms of treatment.

Breathing exercises

The breathing protocol performed by the subjects consisted of 9 breathing exercises that were designed to encourage abdominal breathing as well recruit the pelvic and thoraco-abdominal diaphragms as the primary mechanical drivers while breathing (Vranich *et al*.)

Osteopathic evaluation

Subjects were evaluated for somatic dysfunction in 10 key areas throughout the body. Each area was given a severity value using a standardized scale from 0 to 4, for a total body score between 0 and 40.

Respiratory measurements

Thoracic range of motion (TROM) of the thoracic cage was calculated by measuring the diameter, in inches, of the thoracic cage at the inferior costal margin with inhalation and exhalation. A score was calculated by placing the measurements into the following equation:
(Inhalation- Exhalation) / Exhalation X 1000 = TROM (Vranich *et al*.). The subject's respiratory condition were also measured with a peak flow meter at each visit.

Data Analysis

Data analysis was performed using SPSS analytic software (IBM, Arowonk NY). ANCOVA was applied to examine for differences in outcome related to treatment order. Outcomes from each protocol (BE alone, OMT alone, BE/OMT combined) was compared to baseline for Peak Flow (PF), range of motion (ROM), and Somatic Dysfunction Score (SDS). For normally distributed continuous data, ANOVA and paired T-test compared results to the subjects' baseline. Where continuous data was not normally distributed and for ordinal data, Friedman's test and Wilcoxon signed-rank tests were used. In each case, Bonferroni correction for multiple measures was applied to the p-values. Effect size was calculated for continuous data by dividing t statistic by standard deviation (Cohen 1988), and for comparisons generated via Wilcoxon test, by dividing Z score by square root of N. (Pallant 2007)

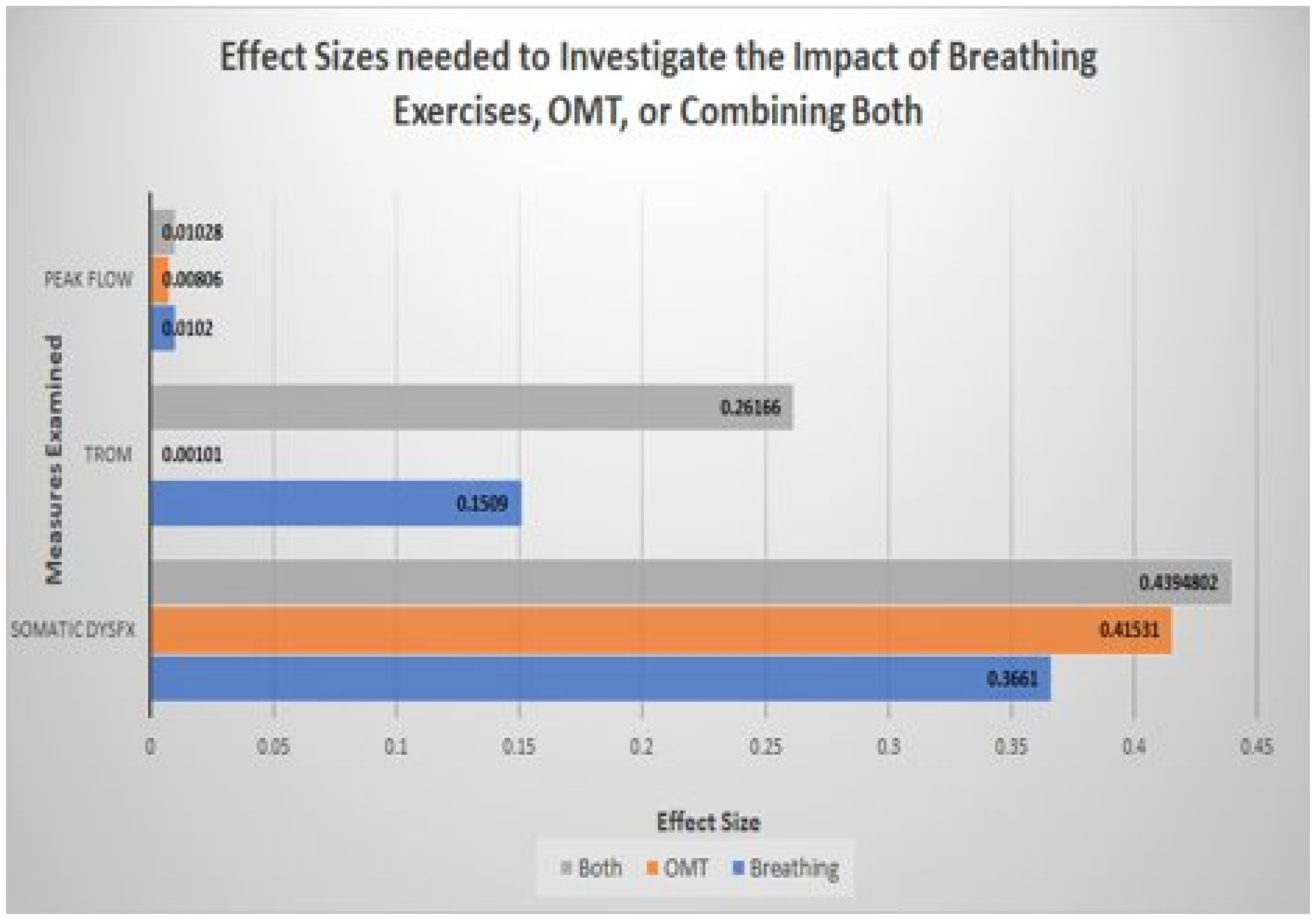

Figure 1. Collecting different forms of data required different statistical approaches to derive accurate effect sizes (ES) for each category. The absolute value of the calculated ES were graphed for ease of illustration, but since the magnitude is of utmost importance, it was carefully maintained. Before calculating each individual measured ES, the lack of statistical significance in an ANCOVA test determined that the order in which subjects participated in each group had no effect on the data results; PF p= 0.093; TROM p=0.429; SD p=0.097. This allowed us to examine the groups individually. Wilcoxon was used for determining the ES for somatic dysfunctions (SD) and range of motion (TROM). As the TROM data was not of normal distribution, a Friedman was also needed. Peak Flow (PF) could be accurately discovered as a Cohens D. The results concluded the largest ES is when OMT and Breathing are combined, for all measures. The OMT alone has an ES larger than Breathing alone in reference to SD. However, the OMT ES is substantially less than Breathing in TROM and marginally less in PF.

Sources

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Discussion

When estimating the effect size (ES) for the somatic dysfunction (SD) score, the OMT/breathing group had the largest magnitude (-0.44) by a notable margin, which leads us to believe that combining OMT and breathing exercises (BE) may have a synergistic effect in improving somatic dysfunctions compared to OMT or BE alone. Additionally, statistically significant improvements in somatic dysfunction were seen with OMT alone (p=0.042) and when BE were combined with OMT (p=0.028). However, the BE group did not show statistical significance here (p = 0.09), these results may be evidence that OMT is necessary in the treatment of SDs to unlock the full benefit of the BE. Overall, this pilot study corroborates with the biomechanical influence of BE assisting in OMT success and maintenance (Courtney, 2011).

The peak flow test in the Breathing/OMT group had a slightly larger magnitude (0.01) compared to the other two groups. The results suggests that some synergy may exist between the treatments, but larger studies are needed to fully establish this relationship.

A negative ES for the thoracic range of motion implies that there was no improvement in all three groups. We speculate that during the measurements, if subjects correctly breathed with their abdominal cavity, as oppose to their thoracic cavity, then the data collected may have shown improvement. However, subjects were not coached on how to take a proper breath immediately before measurements were taken, in a hopes that the subjects would subconsciously do as they practiced during the research. Since data collectors subjectively observed that most subjects did not breath through their abdominal cavities, it was speculated that 2 weeks was insufficient to change subconscious breathing patterns.

Most importantly, the effect sizes as estimated in this study may aid in sample size calculations required for future studies.

Acknowledgments

We would like to thank Dr. Lori McGrew for assisting with the statistical analysis of the data. We would also like to thank our subjects for participating in this research.