Spinal Manipulative Therapy for Elderly Patients With Chronic Obstructive Pulmonary Disease: A Case Series

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Abstract

Objective: The objective of this case series is to report the results of spinal manipulative therapy (SMT) for people with chronic obstructive pulmonary disease (COPD) who were older than 65 years.

Methods: The study design was a prospective case series. Six patients of a long-term care center who were older than 65 years and having COPD underwent a course of 12 SMT sessions over a 4-week period. Each SMT session consisted of manually applied spinal manipulation and instrument-assisted spinal manipulation delivered by a doctor of chiropractic. Lung function measurements were recorded at baseline and at 2 and 4 weeks. The occurrence and type of any adverse events (AEs) related to SMT were recorded at each SMT session.

Results: One male and 5 female patients took part in the study. The average age was 79.1 years (range, 68-89 years). There was a clinically significant increase in forced expiratory volume in the first second after SMT in 4 of the 6 patients at 2 weeks. This was sustained in only 1 patient at 4 weeks. No clinically significant changes were observed for forced vital capacity at 2 or 4 weeks. One hundred forty-four manually applied spinal manipulations and 72 instrument-assisted spinal manipulations were administered during the intervention period. No major or moderate AEs were reported. Only minor AEs were reported after 29% of the intervention sessions, with 1 AE being reported for each patient. All AEs resolved within 48 hours.

Conclusions: This case series offers preliminary evidence that SMT may have the potential to benefit lung function in patients with COPD who are older than 65 years. (J Manipulative Physiol Ther 2011;34:413-417)

Key Indexing Terms: *Chronic Obstructive Pulmonary Disease; Manipulation, Spinal; Chiropractic*

There is some evidence to show that spinal manipulative therapy (SMT) may be of some benefit in the management of chronic obstructive pulmonary disease (COPD).[1-3] The rationale for its use focuses on changing the flexibility of the chest wall, in particular, the mobility of the intervertebral and costovertebral joints. These contribute to altered thoracic movement patterns that have been observed in chronic respiratory disease.[1,3] At the time the case series being reported here was initiated, there had only been 3 reports in the literature relating to SMT and lung function in people with chronic respiratory disease. Of these reports, 2 were for people younger than 60 years,[2,4] whereas the third did not report the age of the participants.[1] More recently, a study involving SMT and patients with COPD who were older than 65 years has been reported.[5] As the prevalence of COPD increases appreciably over the age of 60 years,[6-8] further studies on the effect of SMT in this group of people seem pertinent.

Chronic obstructive pulmonary disease is usually associated with progressive airflow limitation.[9] Apart from smoking cessation, short-term increases in lung function are normally associated with pharmacologic or surgical interventions in COPD.[9,10] Interventions commonly used in managing COPD, such as pulmonary rehabilitation, have only a minimal effect on pulmonary function measurements.[11] Because slowing the loss of lung function is an important goal in managing COPD,[9] other interventions that have the potential to improve lung function should also be investigated.

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In the case of SMT, administering this intervention to people older than 65 years brings with it certain age-related variables that need to be considered before the intervention can be safely applied. If additional factors exist that increase the risk, the likelihood of adverse events increases and may act as a deterrent to any investigation. Because the incidence of adverse events in any population that receives manual therapy is of interest to manual therapists,[12] a clearer picture of the frequency and nature of any adverse events resulting from administering SMT to older people with COPD is required.

An *adverse event* (*AE*) has been defined as any negative response, whether expected or unexpected, that is associated with the application of an intervention.[13,14] With respect to manual therapy, a system that classifies AEs as *major*, *moderate*, or *mild* has recently been proposed as a method of improving the way AEs are recorded.[12,15] A major AE is defined as being of medium to long-term (>5 days) duration, medium to severe in intensity, unacceptable, serious, distressing, and requiring further treatment. A moderate AE is similar to a major AE except being medium in intensity, whereas a mild AE is defined as short term, mild in intensity, nonserious, and transient/reversible with the patient's function remaining intact. Major and moderate AEs require further treatment, whereas mild AEs do not, usually resolving within 48 hours.[15] In manual therapy, a mild AE includes posttreatment muscle soreness in the surrounding area receiving treatment.[12,16,17] Soreness may be a typical and expected finding, such as one may experience soreness after exercise or stretching.

An AE of relevance in the context of COPD is fracture. The incidence of fracture associated with SMT appears to be rare.[18-20] However, COPD is associated with periods of immobilization, decreased weight-bearing activities, prolonged use of glucocorticoids, and osteoporosis, each of which is known to increase the risk of fracture.[21] Some authors note that the mere presence of osteoporosis should be a contraindication for SMT.[22] This view, if adopted, would pose a barrier to investigating the use of SMT in many patients with COPD.

In attempting to gauge the risk associated with applying SMT to people with COPD, it is pertinent to consider the scenario of chest physiotherapy. Chest physiotherapy encompasses a variety of techniques including some that apply a medium level of force directly to the surface of the chest wall. Chest percussion, vibration, and rib springing are all airway clearance techniques commonly used in COPD that involve direct pressure to the external chest wall in a way that could be regarded as similar to SMT.[10,23] Percussion consists of rhythmically and alternately striking the chest wall with cupped hands to mechanically jar and dislodge retained secretions in underlying lung segments. The technique is recommended to be administered for 2 to 5 minutes per lung segment.[23] Vibration involves high-frequency oscillations of the chest wall combined with compression of the ribs in a springing fashion (rib springing) 3 to 4 times during exhalation. These techniques are designed to mobilize the secretions that have been dislodged during chest percussion. Precautions and contraindications for these techniques include a history of rib fracture and/or the presence of osteoporosis.[24] Assuming that these comorbidities are screened for before application, it would appear that these techniques are safe for people with COPD because reports of fracture or serious AEs resulting from these techniques are rare in this population.[25-27]

By extending this analogy, SMT could also be safe to administer to people with COPD if a history of fracture and osteoporosis has been screened for. Under this scenario, investigating the effect of SMT on people older than 65 years with COPD would be feasible. Conducting such a study seems appropriate, given the increasing incidence of COPD among this age group.

To gauge whether administering SMT to patients older than of 65 years with COPD has potential to benefit lung function while being safe to apply, we report a prospective case series of 6 patients older than of 65 years with COPD who underwent a 4-week trial of SMT.

Methods

Residents of a long-term care facility in New York were identified by chart review and were approached to participate in the study. Any patient older than 65 years with a diagnosis of COPD was included as a potential patient in this case series. Exclusion criteria were severe dementia (determined by chart review), inability to perform spirometry, presence of certain contraindications to SMT including severe osteoporosis, a history of fracture associated with osteoporosis, cauda equina syndrome, abdominal aortic aneurysm greater than 3.5 cm, spinal neoplasia or metastatic disease, destructive joint pathology such as rheumatoid arthritis, progressive myelopathy, neurogenic claudication, or spinal surgery within the past 6 months.

Severe osteoporosis was determined by plain film radiography only. This method was chosen for pragmatic reasons because plain film appearance of thin cortices and expanded intratrabecular spaces, considered to represent widespread osteopenia,[28] has been shown to be a strong predictor of low bone mass in women older than 50 years.[29] Any patient with such a plain film radiographic appearance was assessed as having severe osteoporosis[28] and was excluded from the study.

Lung function measures, including forced expiratory vital capacity (FVC) and forced expiratory volume during the first second (FEV_1), were recorded for each patient by a single respiratory therapist using either a Covidien-Nellcor or Puritan Bennett spirometer (Boulder, CO). These measurements were taken according to the guidelines set down by the American Thoracic Society for prebronchodilator measurements.[11,30] There is no accepted minimum