Clinical Integration of Osteopathic Manipulative Medicine

Family/Internal Medicine: Chronic obstructive pulmonary disease (COPD)

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Introduction: Chronic obstructive pulmonary disease (COPD) affects more than 5% of the population and is ranked the third leading cause of death in the United States. COPD is an obstructive lung disease with worsening airflow over time. Tobacco smoke is the most common, and preventable, cause. Other factors including air pollution and genetics, Alpha 1-antitrypsin deficiency. Prolonged exposure to these irritants results in inflammation, airway narrowing, hyper secretion and destruction of lung alveoli resulting in emphysema. Diagnosis is based on clinical presentation and pulmonary function tests showing a nonreversible obstructive pattern and decreased DLCO. Current treatments include smoking cessation, pneumococcal vaccination, rehabilitation, inhaled bronchodilators, steroids and supplemental oxygen.

Patient Presentation:

- Cough
- Dyspnea
- Sputum production
- Wheezing
- Chest tightness
- Barrel chest
- Lung hyperinflation
- Decreased breath sounds
- Crackles at lung bases on auscultation
- Decreased diaphragmatic excursion
- Accessory repertory muscle use
- Exhalation through pursed lips
- Cyanosis
- Clubbing of digits
- Yellow stained fingers from tobacco use

Differential Diagnosis:

- A1 antitrypsin deficiency
- Asthma
• Bronchiectasis
• Bronchiolitis obliterans
• Bronchitis
• Cardiac ischemia
• Congestive heart failure leading to pulmonary edema
• Neoplasm
• Occupational exposures: berylliosis, silicosis, asbestos
• Pneumonia
• Pneumothorax
• Pulmonary edema
• Pulmonary embolism
• Tuberculosis

**Clinical Pearls and Diagnostic Tools:**

- Clinical diagnosis: COPD may be differentiated from restrictive causes of lung disease by pulmonary function tests. COPD will have an increased FEV1, and an increased FEV1/FVC ratio, an increased Vital capacity and an increased residual volume. Compared to asthma, COPD patients will have a decreased DLCO (carbon monoxide diffusion in the lung) and their PFT does not improve with bronchodilator therapy.
- Management: If a patient presents with a possible COPD exacerbation in the hospital setting several tests should be ordered to determine the etiology and rule out differential diagnosis. X-ray and CBC may be ordered to rule out pneumonia. BNP may be ordered to rule out CHF. ABG may be ordered to determine the severity of the exacerbation. EKG and cardiac enzymes may be ordered to rule out cardiac ischemia.
- Treatments: the mainstay of COPD management is an anticholinergic bronchodilator along with smoking cessation and pulmonary rehabilitation. Other treatments include inhaled beta2-agonists, inhaled glucocorticoids, Phosphodiesterase-4 inhibitors, antimuscarinics, supplemental oxygen, flu and pneumococcal vaccination and surgery.

**Osteopathic Manipulative Medicine (OMM) Integration:**

Osteopathic manipulative medicine has been studied examining how treatment impacted different symptoms, vitals and pulmonary function tests (PFT) of those affected with COPD. Manual Therapy published a review article examining PFT outcomes with treatment vs. light touch in several studies. Osteopathic manipulative treatment was found to increase FEV1, VC, TLC, O2 sat, and patient reported outcomes in several reviewed studies. However, the article stated study quality to be poor and concluded only a 1.5% minimal improvement of FEV1/FVC was seen (1).

Another study examined the change in 6 minute walk times in patients treated with OMT and pulmonary rehabilitation vs pulmonary rehabilitation alone. This study found that with the addition of OMT, patients had greater exercise tolerances and reduced residual volume (RV) (5).
Unfortunately there is a poverty of studies with enough statistical power to definitively determine the impact of OMT on COPD. Furthermore, current studies still report conflicting evidence. Noll et al., 2008 published results showing a decrease in FVC and an increase in RV on PFT’s after OMT (2). Further research is needed to conclude OMT’s role in the management of COPD.

**Osteopathic Structural Examination:**

- Scan for viscerosomatic reflexes from the lungs: T2-T6
- Cranial and OA dysfunction
- Thoracic inlet - 1st rib and clavicle restrictions
- Respiratory diaphragm restrictions and attachments (lower ribs 6-12 and lumbar spine)
- Rib cage, sternal restrictions, and spine
- Chapman’s points of the lung:
  1. Anterior: Upper lung: 3rd intercostal space lateral to the sternum. Lower lung-4th intercostal space lateral to the sternum.
  2. Posterior: Upper lung- T3 lamina of TP. Lower lung T4 lamina of TP

**Treatment Options:**

Goals of osteopathic treatment is to directed towards decreasing musculoskeletal restriction (specifically muscle of respiration and thoracic cage) to allow of improved thoracic cage movement and to decrease work of breathing.

- Sub-occipital release
- OA decompression
- Cervical: Myofascial, muscle energy, BLT, counterstain, FPR
- Thoracic inlet release
- Ribs and thoracic spine - Rib raising, BLT, MET, HVLA (With HVLA - Caution if pt is osteoporotic due to steroid or not able to tolerate procedure)
- Respiratory diaphragm release
- Lumbar: BLT, Inhibition, Psoas release
- Treatment of the chapman points
- Clavicle release
- Scapular release
- Pectoral release
- Quadratus lumborum release
- Sacral release

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References:


