Clinical Integration of Osteopathic Manipulative Medicine

Internal Medicine – Pneumonia

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Intro: Pneumonia is an inflammatory condition of the lung that is usually caused by an infection, bacterial or viral, and less commonly by other microorganisms. It frequently starts as an upper respiratory tract infection that moves into the lower respiratory tract and primarily affects the alveoli. Pneumonia is typically acquired from the community (community-acquired pneumonia, or CAP), but also remains a burden of hospitalized patients as the second most common nosocomial infection. More than 3 million cases of pneumonia occur annually in the United States. It is the fourth most common hospital discharge diagnosis in the US, with the majority of pneumonia-related hospital admissions occurring in persons 60 years and older. The mean length of stay (LOS) is 5.0 days, with the elderly on average having a longer mean LOS and greater severity and mortality than younger age groups. Antibiotics have generally been effective for the treatment of infection; however the emergence of resistant strains of bacteria threaten the success of treatment. Therefore, adjunctive nonpharmacologic treatments for pneumonia, like OMT, may enhance conventional pharmacologic therapy.

Patient presentation:

- Productive cough
  - S. Pneumoniae classically rust-colored sputum
  - Pseudomonas, Haemophilus, and pneumococcal species may produce green sputum
  - Klebsiella species classically associated with red currant-jelly sputum
  - Anaerobic infections produce foul smelling or bad-tasting sputum
- Fever
- Chills or rigors
- Dyspnea
- Pleuritic chest pain
- Malaise
- Increased respiratory rate

Cough is the most consistent presenting symptom. Atypical bacterial and viral causes of pneumonia may present with a more insidious onset of headache, sore throat, fatigue and myalgias with a dry cough.
Differential diagnosis:

Pneumonia can be classified according to infectious etiology or the setting in which it was acquired:

- Infectious:
  - **Bacterial pneumonia**:
    - Typical organisms: *S. pneumoniae*, *H. influenza*, *M. catarrhalis*, *Klebsiella*, *S. aureus*, and *Pseudomonas*
    - Atypical organisms: *Mycoplasma*, *Chlamydophila*, *Legionella*, *C. burnetii*
    - Anaerobic organisms: *Peptostreptococcus*, *Bacteroides*, *Fusobacterium*
  - **Viral pneumonia**
    - *Influenza A and B; Respiratory syncytial virus; Human parainfluenza virus* are most common

- Settings of pneumonia:
  - **Community-acquired pneumonia (CAP)**: Pneumonia that develops in the outpatient setting or within 48 hours of admission to a hospital
  - **Institutional-acquired pneumonia**: Includes HCAP and NHAP (nursing home-associated pneumonia); pneumonia that develops in the outpatient setting or within 48 hours of admission to a hospital in patients with increased risk of exposure to MDR bacteria
  - **Nosocomial pneumonia**: pneumonia acquired in the hospital

Other differential diagnoses that should be considered include:

- Chronic Obstructive Pulmonary Disease (COPD)
- Asthma
- Pulmonary edema
- Bronchiectasis
- Lung abscess
- Bronchitis

Clinical pearls and diagnostic tools:

- Patient’s history intake should include potential exposures, such as overcrowded institutions, aspiration risks, and symptoms.
- Patients at risk of aspiration, such as those with alcoholism, altered mental status, anatomic abnormalities, dysphagia and seizure disorders, are also at an increased risk of developing pneumonia.
- Immunosuppression and comorbid conditions, such as COPD, asthma and smoking, can put patient at increased risk of pneumonia
- Diagnosis is usually based on a combination of physical signs and chest X-ray:
  - Signs include: hyperthermia (fever typically >38°C), tachypnea, use of accessory respiratory muscles, tachycardia, altered mental status
  - Physical findings may include: adventitious breath sounds, decreased breath sounds, egophony, whispering pectoriloquy, dullness to percussion, and lymphadenopathy
Chest X-ray may show lobar pneumonia, bronchopneumonia or interstitial pneumonia.

- Workup should include a complete blood count, a basic metabolic panel, blood cultures and a sputum gram stain and culture.

**Osteopathic Manipulative Medicine (OMM) Integration:** Osteopathic Manipulative Treatment (OMT) has been studied as an adjunctive treatment for hospitalized patients with pneumonia, particularly in the more vulnerable pediatric and geriatric populations. The Multicenter Osteopathic Pneumonia Study in the Elderly (MOPSE), a double-blinded, randomized, controlled trial, studied the efficacy of OMT in conjunction with conventional treatment for pneumonia in 406 subjects aged 50 years or older. Though intention-to-treat analysis found no significant differences between groups, per-protocol analysis found a significant reduction in median LOS by one day (P=0.01), duration of intravenous antibiotics by three days (P=0.05), and treatment endpoint (P=0.006) when compared to conventional care only. The OMT protocol included thoracolumbar soft tissue technique, rib raising, doming of the diaphragm, cervical spine soft tissue, suboccipital release, thoracic inlet myofascial release, thoracic lymphatic pump and pedal lymphatic pump. In the 1960s, OMT versus antibiotic therapy was studied in 252 children hospitalized for various respiratory tract infections. The mean LOS was reduced by one day in the combined OMT and antibiotic group versus antibiotic use alone. The OMT protocol in this study consisted of applying rib raising techniques at varying times and durations according to the patient’s age.

**Osteopathic Structural Examination:** These are a summary of osteopathic structural findings/areas of somatic dysfunctions in patients with pneumonia:

- T1 – T10: lower respiratory tract
- C7-T3: upper respiratory tract
- T5-T8: overall congestion of the lungs
- First rib
- Clavicle
- Upper Cervical spine
- Contracted accessory muscles of respiration
- Thoracic paraspinal muscle spasm
- Rib cage
- Diaphragm
- Lymphatic congestion

**Treatments options:** Importance of gentle, relaxing treatments has been emphasized. Nonspecific treatments, such as rib raising, should be applied bilaterally even when pneumonia is unilateral. Typical duration and frequency of treatments is 15 minutes, two treatment sessions per day:

- Rib raising
- Doming the diaphragm
- Paraspinal inhibition
- Thoracic outlet myofascial release
- Suboccipital release
- Soft tissue to the cervical/thoracic region
- Clavicle release
- Lymphatic thoracic/pedal pump
- Splenic pump

References