**PNEUMONIA**

**Etiology**
- Caused by various microorganisms
- Occurs most commonly with impairment of the lung defense mechanisms
- Previous colonization of upper airways usually precedes infection

**Pneumonia**
- An acute inflammation of the lung tissue due to a microorganism
- Involves bronchial tubes, respiratory bronchioles, alveolar ducts, & sacs
- Most common cause of death from infection in US

**Conditions that Predispose Individuals to Pneumonia**
- Chronic lung disease with infections
- Alcohol abuse
- Seizure disorders
- Altered consciousness
- Neuromuscular disease
- Immunologic disorders
- Malignant conditions/treatment
- Surgical procedures

**TABLE 3–1. CAUSES OF IMPAIRED PULMONARY DEFENSES**
- Allergic protective effects of cilia and mucus
- Suppressed or ineffective cough
- Impaired consciousness
- Obstructing airway lesions
- Abnormal mucus
- Defective cellular immunity
- Impaired humoral immunity
- Recent viral infection

**Wet hair will not cause pneumonia!**
Pathogenesis / Pathology

- Organism in distal airway incites inflammatory process – inflammatory exudates and cells
- Fluid and cellular debris fill air sacs
- WBCs (neutrophils) invade area, phagocytize organisms and release enzymes/immunologic mediators
- Atelectasis

Other Complications

- Necrotizing pneumonia
- Pleural effusion
- Septicemia
- Parapneumonia
- Bronchopneumonia (airways + lung parenchyma)

Pathophysiology

- Reduced lung volumes—can’t take a deep breath thus can’t cough
- Alteration of V/Q
- Arterial hypoxemia
  - PaO2
  - SaO2

Clinical Manifestations

- Symptoms of infection
  - General fatigue
  - Chills and fever
  - Cough / chest pain
  - Dyspnea
- Previous upper respiratory symptoms
- Expectoration will vary
- Extrapulmonary symptoms: mental confusion can overshadow the respiratory symptoms
Physical Exam
- Fever
- Tachycardia
- Tachypnea
- Poor chest excursion
- Dull percussion
- Decreased BS with inspiratory crackles
- Increased fremitus

Laboratory Findings
- Decreased PaO2 & PaCO2
- Increase pH
- Increased WBCs
- Blood cultures may be positive (3 days)

CXR Findings
- Main clue for diagnosing pneumonia
- Homogenous density involving large area of lung tissue

Segmental Pneumonia

Diagnosis and Classification
- Difficult to identify causative organism
- Sputum sample is not reliable
- Delay in identifying organism delays treatment
- 3 categories:
  - community-acquired pneumonias
  - hospital-acquired pneumonias
  - immuno-compromised host
**Most common cause of bacterial pneumonia**
- Strepococcus pneumoniae
  - Gram positive
  - Polysaccharide capsule
- Staphylococcal pneumonia
  - Staphylococcus aureus
    - Transmitted by cough
    - Seen with children and immune compromised patients.

**Atypical pneumonia**
- Mycoplasma pneumoniae
  - “Walking pneumonia”
  - Under 40
  - Common among college students
  - Minimal symptoms

**Community-Acquired Pneumonia**
- Contracted outside of hospital
- Bacterial pneumonia often caused by Streptococcus pneumoniae;
- Haemophilus influenza (gram-) common in chronic lung patients
- Klebsiella pneumoniae & Escherichia coli are common in alcoholics and diabetics
- Anaerobic organisms typical with aspiration

**Others**
- Legionella pneumophilia
- Mycoplasma pneumoniae most common community acquired pneumonia
- Viral pneumonias uncommon, but can be caused by influenza, chickenpox and adenovirus

**Hospital Acquired Pneumonias**
- Pneumonia contracted after 3 days in hospital
- Frequently due to gram negative bacteria and staphylococci
- Patient is pre-disposed due to: environment, medical procedures, increase use of anti-microbials, cytotoxic drugs
- Resistant organism- MRSA

**Immuno-compromised Host**
- Humoral immunity patient will lack antibodies and are more susceptible to infection with bacteria
- Cellular immunodeficiency have recurrent infections with low-virulence or opportunistic organisms, ie fungi, Pneumocystis carinii
Aspiration pneumonia

- GI contents enter lung
- Aspiration of upper airway organisms
- Most common cause of anaerobic infections
  - Lung abscess and empyema
- pH of aspirates key to dx
- GERD
- Swallowing mechanism
  - Dysphagia
  - Stroke

Management

- Antibiotic therapy
- Hydration
- Nutrition
- Oxygen therapy
- Analgesics
- Encouragement of deep breath & cough
- Other measure to alleviate symptoms
- HHN / CPT ???

Antibiotic Therapy

- Sputum and blood cultures for culture and sensitivity
- Initiated in timely manner; broad spectrum antibiotic (3rd generation cephalosporin)
- Nosocomial infections will use 2nd or 3rd generation cephalosporin or Unasyn with moderate disease; big guns for sicker patients

Assessment of Cough

- Onset
  - What precipitates it?
  - What stops it?
  - Acute or gradual onset?
- Effective
- Inadequate
- Productive
- Dry
- Chronic

Lose your license……
What is wrong with this picture?

Preventative Measures
- Good personal health habits
- Good nutrition
- Avoid excessive alcohol and smoking
- Hospital infection control
- Prevention of aspiration
- Careful use of anti-microbial therapy
- Vaccinations
- Avoid contact with infected persons

THANKS FOR LISTENING!
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