PNEUMONIA

DR. V. C. SINGEL

Pneumonia

- Definition by Microbes
  - Bacterial – Pneumococcal, Streptococcal
  - Atypical pathogens
  - Fungal
  - Viral
- Definition by Location
  - Lobar pneumonia
  - Bronchopneumonia
- Definition by Acquisition
  - Community acquired pneumonia-(Gm +ve organisms)
  - Hospital acquired pneumonia-(Gm –ve rods)
  - Ventilator-associated pneumonia

Typical

- Sudden onset
- Toxic patient appearance
- Productive cough
- High fever (>39 C)
- Elevated WBC with left shift
- Sputum - bugs
- Defined consolidation

Atypical

- Slow onset
- Patient appears relatively well
- Non-productive or dry cough
- No left shift in WBC
- Sputum - no bugs
- Interstitial or patchy infiltrate

Streptococcus pneumoniae

- Adults
- Sickle cell patients
- High fevers, pleuritic pain, productive cough, rust-colored sputum
- Treatment includes
  - Cephalosporins
  - Respiratory fluoroquinolones
  - β-lactams
  - Macrolides

Staphylococcus aureus

- Nosocomial pneumonia in immunocompromised patients
- Higher rate in patients with influenza
- Abscess formation
- Treatment
  - β-lactams
  - MRSA coverage

Haemophilus influenzae

- COPD
- Sickle cell disease
- Slower onset of symptoms
- Treatment
  - β-lactams
  - Fluoroquinolones
  - Doxycycline
  - Macrolides

Klebsiella pneumoniae

- Alcoholics
- Aspiration
- Hospitalized
- Sickle cell
- Currant-jelly sputum
- Treatment
  - Cephalosporins
  - Aminoglycosides

Pseudomonas aeruginosa

- Chronically ill
- Immunocompromised
- Cystic fibrosis
- Chronic ventilator
- Nosocomial pneumonia
- Rapid onset of symptoms

Pseudomonas aeruginosa

- Treatment
  - Piperacillin-tazobactam, ceftazidime, cefepime, imipenem, meropenem, doripenem (β-lactams)
  - Ciprofloxacin, levofloxacin (fluoroquinolones)
  - Aminoglycosides

GBS

- Neonates and infants
- Respiratory distress and lethargy
- Treatment
  - β-lactams
  - Ampicillin + gentamicin

Enterobacter spp.

- Nosocomial pneumonia
- Elderly
- Treatment
  - 3rd generation cephalosporin
  - Carbapenem

Mycoplasma pneumoniae

- Diffuse bilateral infiltrative (CXR)
- Don't appear ill
- Young adults
- Less severe symptoms
- Rash
- Positive cold-agglutinin test (IgM)
- Treatment
  - Macrolides

Legionella pneumophila

- Aerosolized water (A/C)
- Slow onset
- Nausea, diarrhea
- Confusion, ataxia
- Treatment
  - Macrolides
  - Fluoroquinolones

Chlamydophila pneumoniae

- Very young
- Elderly
- Slow onset of symptoms
- Frequent sinusitis
- Treatment
  - Doxycycline
  - Macrolides

Tests for Pneumonia

- Chest Radiograph
- Arterial Blood Gas
- Complete Blood Count
- Chemistry – Electrolytes, Renal function, Liver function
- Serologic Testing (Atypical pneumonia screen)
- Blood Culture
- Sputum Gram stain and culture, AFB
- Pneumococcal Urinary Antigen
- Legionella Urinary Antigen
- Pleural fluid analysis

Poor prognostic features

- Age > 65 years
- Coexisting disease Diabetes, renal / heart failure, neoplasia, others
- Clinical findings RR > 30/min, SBP < 90mmHg, T > 38.3^{o}C
  Altered mental status
- Lab tests WCC low or very high, Haematocrit < 30%
  Low pO_2
  Renal failure
  Multilobar involvement on CXR, pleural effusion
- Microbial pathogens *Streptococcus pneumoniae*
  Legionella pneumophilia
  Staphylococcus aureus

What are the indications for pneumococcal vaccination in adults?

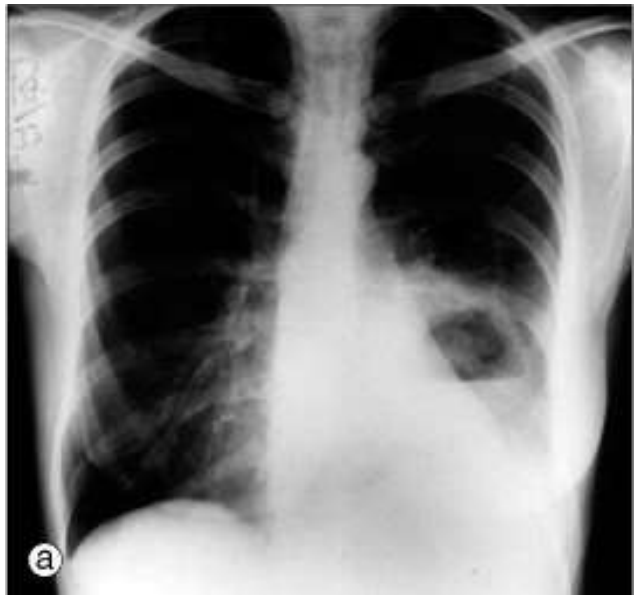
- 65 years and older
- Serious long-term health problem such as heart disease, sickle cell disease, alcoholism, leakage of cerebrospinal fluid, lung disease, diabetes or cirrhosis
- Resistance to infection is lowered due to Hodgkin disease; multiple myeloma; cancer treatment with x-rays or drugs; treatment with long-term steroids; bone marrow or organ transplant; kidney failure; HIV/AIDS; lymphoma, leukemia or other cancers; nephrotic syndrome; damaged spleen or no spleen
- Cigarette smokers ages 19-54

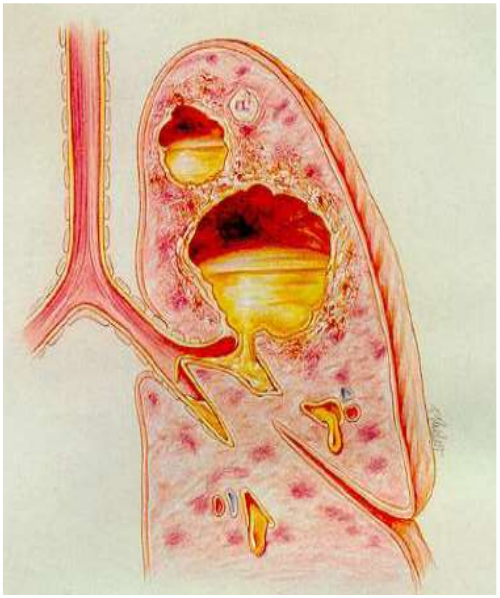
What infectious agent is the cause of pneumonia based on each of the following Gram stain results?

- Gram-positive cocci in clusters ***Staphylococcus aureus***
- Gram-positive cocci in pairs ***Streptococcus pneumoniae***
- Gram-negative rods in 80-year-olds ***Escherichia coli***
- Gram-positive cocci in neonate **GBS**
- Gram-negative rods in neonate ***Escherichia coli***

Lung Abscess

Lung Abscess





Pathophysiology

- Localized necrotic lesion of the lung parenchyma containing purulent material

- Lesion collapses and forms a cavity