

Lecture 5



Health care associated pneumonia

- Additional Notes
- Important
- Explanation
- Examples

Introduction:

- Nosocomial pneumonia: is defined as hospital associated pneumonia (HAP) or health care associated pneumonia (HCAP).
- Pneumonia caused by organisms in hospital which are **usually resistant to antibiotics**.
- Occurring at least **48 -72 hours** after admission and **not incubating** at the time of hospitalization.
- It can divide into 2 types:
 - ✓ Hospital Acquired Pneumonia(HAP).
 - ✓ Ventilator Associated Pneumonia (VAP) in patients with assisted respiration for a period of 48 hours.
- It is the **2nd most common** hospital-acquired infections after urinary tract infection.
- It is the **leading cause of death** from hospital-acquired infections.
- The incidence of nosocomial pneumonia **is highest in ICU** (intensive care unit) patients.
- The incidence of nosocomial pneumonia **in ventilated patients was 10-fold higher** than non-ventilated patients

Pathogenesis

- For pneumonia to occur, **at least one of the following** three conditions must occur:
 - ✓ Significant impairment of host defenses. **e.g. AIDS patients**
 - ✓ Introduction of a sufficient-size inoculum to overwhelm the host's lower respiratory tract defenses.
 - ✓ The introduction of highly virulent organisms into the lower respiratory tract.
- Most common is microaspiration of **oropharyngeal secretions** colonized with pathogenic bacteria.

Classification

- Early-onset nosocomial pneumonia:
 - ✓ Occurs during the first 4 days of admission.
 - ✓ Usually is due to:
 - *S. pneumoniae*
 - MSSA (Methicillin sensitive *S.aureus*)
 - *H.Influenza*
 - Anaerobes
- Late-onset nosocomial pneumonia:
 - ✓ Occurs more than 4 days of admission.
 - ✓ More commonly by Gram negative organisms, especially:
 - *P.aeruginosa*
 - *Acinetobacter*
 - Enterobacteriaceae (*Klebsiella*, *Enterobacter*, *Serratia*)
 - MRSA (Methicillin-resistant *S.aureus*)

Etiology

- Gram negative bacilli:
 - ✓ Frequently particularly in patients with **late-onset** disease and in patients with **serious underlying disease**.
- P.aeruginosa and Acinetobacter
 - ✓ Common causes of **late-onset** pneumonia, particularly in the **ventilated patients**.
- S.aureus:
 - ✓ Isolated in about 20~40% of cases
 - ✓ Particularly common in:
 - Ventilated patients after head trauma, neurosurgery, and wound infection
 - Patients who had received prior antibiotics or Prolonged care in ICU.

- MRSA (methicillin resistant S.aureus):
 - ✓ Seen more commonly in patients who:
 - Received corticosteroids
 - Undergone mechanical ventilation more than 5 days
 - Presented with chronic lung disease
 - Had prior antibiotics therapy
- Anaerobes:
 - ✓ Are common in patients predisposed to aspiration .
 - ✓ Ventilator associated pneumonia (VAP) with anaerobes occurred **more** often with **oropharyngeal** intubation than **nasopharyngeal** intubation.

Ventilator-associated Pneumonia

- Nosocomial pneumonia that has developed in patient who are receiving mechanical ventilation.
- Classification:
 - ✓ Early-onset: within 48-72 hours after tracheal intubation.
 - ✓ Late-onset: after 72 hours
- Requires 2 important processes:
 - ✓ Bacterial colonization of the aerodigestive tract.
 - ✓ Aspiration of contaminated secretion into the Lower airway
- Prevents mechanical clearance by cough and the mucociliary escalator.
- Treatment: **“important”**
 - ✓ Initially be treated with a broad-spectrum antibiotic regimen aimed at covering all likely bacterial pathogen
 - Colistin → Gram -ve
 - Vancomycin → Gram +ve
 - ✓ This regimen should subsequently be narrowed, according to the result of culture.

Treatment

- The pathogen may be influenced by coexisting illnesses, prior treatment, and length of hospitalization.
- Patients with *S.aureus* infection, agents against this organism are necessary, including **Vancomycin** if **MRSA** is suspected.
- **Linezolid** is comparable with **Vancomycin**. It has **less possibility of nephrotoxicity** than Vancomycin.
- Patients has been divided into **3 different groups**.
- Mild to moderate patients **monotherapy** would be effective to them.
- For sever hospital acquired pneumonia **combination therapy** should be instituted until culture result are available.

Quiz

1. Which one of the following is used for gram +ve bacteria.
a. Colistin b. Vancomycin c. Voriconazole

2. The most common cause of pneumonia is:
a. *S. pneumoniae* b. *S. aureus* c. Streptococci

3. Late-onset nosocomial pneumonia occurs during the first 4 days of admission.
a. T b. F