HAP and VAP: Diagnosis and Initial Management

Hospital **A**cquired **P**neumonia: occurring > 48 hrs of hospitalization in non intubated patient
Ventilator **A**ssociated **P**neumonia: occurring > 48 hrs of intubation *or* after extubation in a pt who was recently intubated > 48 hrs

ANY TWO OR MORE ARE PRESENT:

1. New lung infiltrate on CXR or CT
2. Respiratory decline / decreasing PF ratio
3. Fever
4. Leukocytosis
5. Productive cough / copious tracheal secretions

1. Absence of a new infiltrate significantly lowers probability of pneumonia; one must also consider other causes of respiratory decline, including PE.
2. **PF ratio = PO2 / FiO2:** >400 = normal. 399-300 = hypoxemia. 299-250 = resp failure. 249-200 = severe resp failure. <200 = critical resp failure

OBTAIN:

1. Blood cultures
2. Sputum cultures
3. MRSA nasal swab
4. Procalcitonin

1. 15% of pts with VAP are bacteremic.
2. Sputum collected via BAL is **not** associated with improved outcomes versus sputum collected via endotracheal aspirate. Consider BAL if pt is failing therapy despite initially appropriate antibiotics, or if patient is immunosuppressed.
3. MRSA PCR swab has a high negative predictive value for MRSA in the sputum, especially in HAP versus VAP.
4. Procalcitonin levels may be used for serial trending of antibiotic therapeutic efficacy and to guide cessation of antibiotics in complicated pneumonia.

INITIATE ANTIBIOTIC THERAPY

1. Use local ICU antibiogram to select initial empiric coverage.
2. Narrow antibiotic coverage once sputum culture sensitivities are known.

1. If antibiogram is not available, empiric coverage of methicillin-susceptible *S aureus* and gram-negative bacilli such as *P aeruginosa* should be selected, eg, piperacillintazobactam, cefepime, levofloxacin, imipenem, or meropenem.
2. Antibiotic use within the 90 days preceding new pneumonia is the only known risk factor consistently correlated with MRSA and multidrug-resistant Pseudomonas aeruginosa HAP and VAP.
3. Aspiration events that precipitate HAP and VAP are polymicrobial. Thus, even if sputum cultures demonstrate only 1 pathogen, the final antibiotic regimen used to treat a patient with suspected aspiration should include coverage of oral and enteric flora, including gram-negative and anaerobic bacteria.
4. The duration of the antibiotic course in uncomplicated HAP and VAP is 7 days; longer courses have not been shown to reduce rates of recurrent pneumonia, treatment failure, duration of mechanical ventilation, hospital LOS, or mortality. Empyema or pneumonia due to Pseudomonas or Acinetobacter is considered a “complicated” pneumonia due to high relapse rate and merit longer course (14 or more days) of therapy.
5. If a patient is hemodynamically stable, is needing less oxygen, and is tolerating oral intake, oral antibiotics can be used to complete a course of therapy for uncomplicated HAP or VAP.

CONSIDER INF. DIS. CONSULTATION IF:

1. No clinical improvement after 48 hrs of initial therapy
2. Pt is immunocompromised (steroids or other immunosuppressants, malignancy, etc.)
3. Severe pre-existing lung disease (COPD, CF, etc)

REFERENCES

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