EARLY DIAGNOSIS OF COMMUNITY ACQUIRED PNEUMONIA

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PNEUMONIA

It is an acute infective condition of the lower respiratory tract along with recently developed radiological signs.
Disease is single

Aetiology are many

Pathophysiology depends on

Types of micro-organism

Host conditions/responses

Environmental factors
Pneumonia is classified as:

1. Community acquired pneumonia
2. Hospital acquired pneumonia
Community Acquired Pneumonia (CAP)

Definition:

Community acquired pneumonia begins outside of the hospital,
or
it is diagnosed within 48 hours after admission in the hospital in a patient, who has not resided in a long term care facility for 14 days and move before the onset of symptoms.
Community Acquired Pneumonia (CAP)

Epidemiology:

- 1 million / year in UK
- 2-3 million cases/ year in USA
- Commonest infective cause of death
- Sixth leading cause of death as a whole
- Mortality- 14% in hospitalized patient
  <1 % in OPD patient
Aetiology:

Streptococcus pneumoniae (30%)
Chlamydia pneumoniae (10%)
Mycoplasma pneumoniae (9%)
Legionella pneumophilla (5%)
Pseudomonas aeruginosa (9-20%)
Haemophylus influenzae (3%)
Aetiology : ( cont. )

Staphylococcus aureus < 1%
Chlamydia psittacosi < 1%
Actinomycosis Israeli < 1%
Primary viral pneumonia ( 30% )
Enteric gram negative bacteria
Moraxella catarrhalis
40% cases no organism is isolated
Mode of infection of CAP

- Ingestion of micro-organism from the oropharynx
- Inhalation of the micro-organism (droplet infection)
- Hematogenous spread
- Spreading from surrounding structures
Features related to CAP

Clinical consequences depends on

- Type of organism involved
- Physical conditions of the individuals affected and their personal habits

  - extreme of ages
  - pre-existing COPD
  - Other co-morbid conditions
  - Immunosuppression including HIV
  - alcoholism
  - smoking
Early diagnosis of CAP

Diagnosis is based on-

- History
- Physical examination
- Investigations
History:
- Fever (acute/subacute)
- Cough
- Sputum
- Breathlessness
- Rigors
- Sweating
History: (cont.)

- Chills
- Chest discomfort
- Pleuritic chest pain
- Fatigue
- Myalgia
- Anorexia, headache, abdominal pain
Physical findings:

**General:**
- Temperature
- Tachypnea
- Tachycardia
- Cyanosis
Physical findings: (cont.)

Chest findings:

- Restricted chest movement
- Impaired on percussion
- Bronchial breath sound
- Rales
- Crepitation
- May be features of pleural effusion
Characteristic clinical features of some common causes of CAP

Streptococcus pneumonia:

- Increasing age
- Co-morbidity
- Acute onset
- High fever
- Pleuritic chest pain
Characteristic clinical features…

Bacteriaemic streptococcus pneumonia:

- Female sex
- Excess alcohol
- Diabetes mellitus
- COPD
- Dry cough
Characteristic clinical features...

Legionella pneumophila:

» Young patient
» Smokers
» Absences of co-morbidity
» Diarrhea
» Neurologic symptoms
» More severe infection
» Multi-system involvement
» Altered LFT and S. Creatinine Kinase
Characteristic clinical features...

Mycoplasma pneumoniae:

- Young patient
- Prior antibiotics
- Multisystem involvement
- Erythema nodosum
Characteristic clinical features…

**Chlamydia pneumonae:**

- Longer duration of contact with sick bird
- Symptoms before hospitalization
- Headache
- Associated with Sinusitis, Pharyngitis, Laryngitis
Characteristic clinical features...

Coxiella burnetii:

- Male sex
- Dry cough
- High fever
- Farmer or abattoir contact
- Conjunctivitis
- Hepatomegaly
Differential Diagnosis:

- Pulmonary infarction
- Pulmonary/Pleural Tuberculosis
- Pulmonary oedema
- Inflammatory conditions below the diaphragm: Cholecystitis, Perforated peptic ulcer, Subphrenic abscess, Acute pancreatitis, Hepatic amoebiasis
- Rare: Pulmonary Eosinophilia, Connective tissue disease, Acute allergic alveolitis, Wegener’s granulomatosis
Investigations:

Purpose:

- To obtain a radiological confirmation
- To exclude differential diagnosis
- To obtain a microbiological diagnosis
- To assess the severity
- To identify the development of complications
Routine investigations for all CAP

- X-ray chest P/A and lateral view
- Blood count
- Sputum for gram stain
- Sputum for culture (specially who requires hospitalization)
Investigations: (cont.)

Radiological findings:

X-ray chest:

- Affects a lobe or segment
- Patchy air space infiltrate
- Lobar consolidation with air bronchogram
- Diffuse alveolar or interstitial infiltrates

Additional findings-

- Pleural effusion
- Cavitation
Investigations: ( cont. )

CT scan of chest:

- In general- little role
- May have better sensitivity in mycoplasma pneumonia
Investigations: (cont.)

Are there any characteristic radiological features in different type of CAP?

- No unique radiological pattern was found
- Few characteristics are reported
Investigations: ( cont. )

- Homogenous shadowing is less common in mycoplasma pneumoniae.
- Multilobe involvement at presentation is more likely with bacteraemic pneumococcal pneumonia.
- Multilobe involvement is less common in legionella pneumonia.
- Hilar lymphadenopathy is found in some cases of mycoplasma.
Investigations: ( cont. )

Sputum for microbiological investigations:

- **Not needed in patients managed in the community**

- **Should be considered who donot respond to empirical treatment**

- **Should be looked for M. tuberculosis who has persistent productive cough with fever and systemic features**
Investigations: (cont.)

Sputum culture

May identify unexpected or antibiotic resistant pathogens such as

- S. Aureus, or penicillin resistant pneumococci

-for non severe CAP and can not expectorate sputum, not received antibiotic

-with severe CAP and fail to respond to treatment
Investigations: (cont.)

Special test:

- Blood culture
  - Pre-antibiotic period
  - Unresponsive to treatment
  - Recommended for all patients with CAP who are suspected for S. pneumoniae/ H. influenzae/ S. aureus/ K. pneumoniae
Investigations: (cont.)

Special test: (cont.)

- Arterial blood gas analysis
- Others

  Serum glucose
  Blood urea
  Serum creatinine
  LFT

  Serum electrolytes
  Serological tests
  C-Reactive protein
Investigations: (cont.)

Serological tests:

- PCR/ CFT in mycoplasma pneumonae
- DIF/ PCR in case of legionella pneumonae
- Micro-immunofluorescent test for Chlamydia

Urine test:

- Urinary antigen assay for legionella serogroups
Investigations: (cont.)

Measurement of CRP and its importance:

- It is raised in CAP
- Higher in those who did not received antibiotics
- More with bacterial than in mycoplasma, viral pneumonia
- CRP > 100mg/dl may be considered a cut off value to differentiate from other causes
THANK YOU ALL