

PNEUMONIA

- Pneumonia is the inflammatory condition of lungs primarily affecting the alveoli.
- Pneumonia can be classified anatomically as
 - Lobar pneumonia
 - Bronchopneumonia
 - Interstitial pneumonia
- Pathologically there is consolidation of alveoli or infiltration of interstitial tissue with inflammatory cells

ETIOLOGY

- Viral
 - RSV
 - Influenza
 - Parainfluenza
 - Adenovirus
 - Seen in 40% Cases

- Bacterial
- Common bacterial agents in first 2 months are gram negative klebsiella ,E.coli and gram positive pneumococci and staphylococci
- Between 3month to 3 years –Pneumococci,H.influenza
And staphylococci
- After 3 years-Pneumococci and staphylococci
- Chlamydia and Mycoplasma may cause community acquired pneumonia in adolescents and children

RISK FACTORS

- Low Birth weight
 - Malnutrition
 - Vitamin A deficiency
 - Lack of breast feeding
 - Passive smoking
 - Large Family size
 - Family history of bronchitis
 - Advanced birth order
 - Crowding
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- Young age

Clinical features

- Onset of pneumonia is insidious starting with upper Respiratory tract infection or acute with high fever , Tachypnea,dyspnea and grunting respiration
- Flaring of ala nasi and retraction of lower chest and intercoastal spaces
- Signs of consolidation are observed in lobar pneumonia

Pneumococcal Pneumonia

- Respiratory infection due to *S.pneumonia*
- Transmitted by droplet
- Common in winter
- Incubation period in 1-3 days

Clinical Features

- Onset is abrupt with headache, chills, cough and high fever

Cough-initially dry and later with thick rusty sputum

- Chest pain radiating to shoulder or abdomen
- Severe Cases-Grunting, Chest indrawing, difficulty in feeding and cyanosis
- Percussion note is impaired, air entry is diminished
- Crepitations and bronchial breathing heard over areas of consolidation

DIAGNOSIS

- History
- Examination
- X-ray-finding of lobar consolidation
- Leukocytosis
- Sputum-Gram staining and culture
- Blood culture

TREATMENT

- Penicillin G 50000IU/kg/- IV or IM in divided doses -7 days
- Therapy with IV cefotaxime, ceftriaxone or coamoxiclav

Staphylococcal Pneumonia

- Infancy and childhood
- Primary infection or secondary to staphylococcal septicemia
- Complication – measles, influenza, cystic fibrosis
- Empyema below 2 years of age is nearly always staphylococcal in etiology

Pathology

- Multiple micro abscesses are formed which erode the Bronchial wall and discharge their content in bronchi
- Air enters the abscesses during inspiration
- Progressive inflation results in formation of pneumatoceles –pathognomonic

TREATMENT

- Fever is controlled by antipyretics
- Hydration maintained by IV fluids
- Oxygen administered to relieve the dyspnea and cyanosis
- Antibiotic therapy with penicillin G ,Coamoxiclav or Ceftriaxone-2-6 weeks

Treatment of complications

- Empyema and pyopneumothorax –intercostal drainage under water seal or low pressure aspiration
- Metastatic abscess –surgical drainage.
- Significant pleural thickening-thoracotomy or thoracoscopic surgery

Hemophilus pneumonia

- Occurs between age of 3 month-3 year
- Always associated with bacteremia
- Presents with moderate fever, dyspnea, grunting and Retraction of lower intercoastal space

Complications-Bacteremia, pericarditis, empyema, meningitis and polyarthrititis.

Treatment- parental ampicillin 100mg/kg/day and coamoxiclav.

Streptococcal Pneumonia

- Infection by group A beta-hemolytic streptococci
- Occurs following measles, varicella, influenza or pertussis
- Most important cause of respiratory distress in Newborns

- Clinical features
- onset is abrupt with fever ,chills, dyspnea, rapid respiration and blood streaked sputum
- Signs of bronchopneumonia is less pronounced as pathology is usually interstitial

● Diagnosis

Radiograph- shows interstitial pneumonia with segmental involvement, diffuse peribronchial densities or a effusion

Blood count shows neutrophilic leucocystosis.

TREATMENT

- Penicillin G -50000-100000IU/kg/day -7 to 10 days
- Second generation or third generation
Cephalosporins

Like cefaclor, cefuroxime, ceftriaxone

THANK YOU

Primary Atypical Pneumonia

- Etiological agents-Mycoplasma pneumonia

Chlamydia

Legionella spp

Transmitted-droplet infection

Incubation period-12-14 days

Common in winter among children in overcrowding living

Clinical features

Symptoms

Malaise, headache, fever, sore throat, myalgia and Cough.

Cough is dry at first later with mucoid expectoration
With blood streaked

Signs

Mild pharyngeal congestion, cervical lymphadenopathy

Crepitations

Diagnosis

- X-ray finding show infiltrates involving one lobe, usually lower
- Poorly defined fluffy or hazy exudates radiates from the hilar region with enlarged hilar lymphnodes and pleural effusion

IgM antibody by ELISA during acute stage

IgG antibody after 1 week

Confirmed by PCR

TREATMENT

- Macrolide antibiotics-erythromycin, azithromycin
Clarithromycin for 7-10 days

Pneumonia due to Gram negative organisms

- Etiology-E.coli , klebsiella, pseudomonas
- Affects small children with malnutrition and immunity
- Gradual onset
- Constitutional symptoms are more prominent than respiratory distress
- Radiograph shows multiple areas of consolidation
- Treatment-IV Cefotaxime or ceftriaxone 75-100mg/kg/day with or without aminoglycoside of 10-14 days

Pseudomonas – treated with Ceftazadine

VIRAL PNEUMONIA

- Etiology- Respiratory syncytial Virus is chief cause under 6 months of age
- Others-para influenza, influenza and adenovirus
- Presents with extensive interstitial pneumonia
- Clinical signs of consolidation are absent
- Radiological signs consist of perihilar and peribronchial infiltrates

ALIPHATIC HYDROCARBON ASSOCIATED PNEUMONIA

- Kerosene exerts toxic effects on lungs and CNS
- Milk and alcohol promotes absorption
- Since kerosene has low viscosity and low surface tension, it diffuses quickly from pharynx to lungs.
- Clinical features-Cough, dyspnea, high fever, Vomiting, drowsiness and coma
- Physical signs are minimal
- X-ray chest-ill-defined homogenous or patchy opacities

Treatment

- Vomiting is not induced
- Gastric lavage is avoided to prevent inadvertent aspiration.
- The patient is kept on oxygen
- Routine antibiotics are not indicated

Loefflers Syndrome

- Larvae of many nematodes enter portal circulation and pass through the hepatic vein and inferior vein cava into heart and lungs.
- In lungs it enters capillaries, enter alveoli and block Bronchi with mucus and eosinophilic material

Clinical features include cough, low fever scattered crepitations

Eosinophilia

Treatment is symptomatic

ACUTE RESPIRATORY TRACT INFECTION CONTROL PROGRAM

- Acute lower respiratory tract infection is chief cause of mortality in children below 5 years of age
- Common bacteria causing LRTI in preschool children like H influenza, S.pneumonia are sensitive to antibacterial agents like cotrimoxazole and amoxicillin
- To control death due to LRTI, WHO has recommended a criteria for diagnosis of pneumonia where IMR is $>40/1000$ live births.

- Criteria for diagnosis include rapid respiration
- Rapid respiration is rate more than 60,50,40/min in Children below 2 months, 2-12 months and 1-5 years of age
- WHO recommends that in primary setting, children with cough (2 months-5 years of age) should be examined for rapid respiration and difficulty in breathing, cyanosis or difficulty in feeding.
- If respiratory rate is normal, there is no chest indrawing and feeding is well, the child is assessed to be suffering from URT infection and treated symptomatically

- If the child has rapid respiration and chest indrawing, But no hypoxia, feeding well and does not have danger signs, child may be treated with amoxicillin 40mg/kg twice daily for 5 days
- Chest indrawing, evidence of hypoxia or danger signs (lethargy, cyanosis, poor feeding, seizures), it is severe pneumonia
- Patient require admission, and treatment with iv penicillin or ampicillin and gentamycin for least 5 days.

- IV ceftriaxone can be used as 2nd line drug
- For Children below 2 months old, the presence of any of the following indicate pneumonia: fever >38 degree, seizures, abnormally sleepy or difficult to wake, stridor, wheezing, not feeding, tachypnea, chest indrawing, altered sensorium, central cyanosis, grunting, apneic spells or distended abdomen

Table 15.4: Children (2 months to 5 years) with cough or difficult breathing: Facilitate treatment decisions

Category	Essential features	Treatment category
Cough or cold	No fast breathing; no indicators of severe pneumonia	Home care; home remedy for cough; paracetamol for fever
Pneumonia with or without lower chest indrawing	Fast breathing: 2–12 months ≥ 50 /minute; 1–5 years ≥ 40 /minute Lower chest indrawing, normal saturation	Home care; oral amoxicillin
Severe pneumonia	Lower chest indrawing; unable to drink or breastfeed, convulsions, lethargy, unconsciousness, severe respiratory distress, central cyanosis	Inpatient care IM, IV benzylpenicillin, ampicillin and gentamicin

THANK YOU