

Pneumonia in infants

Pneumonia is the acute or chronic inflammation of the lung parenchyma due to infectious, allergic, physical, or chemical noxious agents. It usually represents an acute inflammation at the level of the respiratory bronchioles, alveolar spaces, and interstitium.


 For more information see *Pneumonia*.

Etiology of neonatal pneumonia and pneumonia in infants

- **In newborns - early onset:**
 - Gram-positive bacteria: *Streptococcus agalactiae* (GBS),
 - Gram-negative bacteria: *Escherichia coli*, *Listeria monocytogenes*, *Klebsiella pneumoniae*
 - amniotic fluid aspiration
- **In newborns - late onset:**
 - often nosocomial strains: *Pseudomonas aeruginosa*, *Enterobacter*, G- rods
 - rarely: *Haemophilus influenzae*, *Streptococcus pneumoniae*, *Ureaplasma urealyticum*, anaerobes, group D streptococci, CMV, HSV
- **In infants (3 weeks to 3 months of age):**
 - respiratory viruses: RSV, parainfluenza 1-3, adenoviruses, influenza
 - bacteria: *Streptococcus pneumoniae*, *Chlamydia trachomatis*
 - rarely: *Ureaplasma urealyticum*, *Bordetella pertussis*, *Haemophilus influenzae*, CMV, HSV
- **In children aged 4 months to 5 years:**
 - respiratory viruses: adenoviruses, influenza, parainfluenza, rhinoviruses, RSV
 - bacteria: *Streptococcus pneumoniae*
 - rarely: *Haemophilus influenzae*, *Mycoplasma pneumoniae*, *Chlamydia pneumoniae*, *Moraxella catarrhalis*, *Staphylococcus aureus*, *Mycobacterium tuberculosis*.^[1]

Clinical picture

 For more information see *Bacterial pneumonia*.

 For more information see *Atypical pneumonia*.

Types of pneumonia

- Pneumonia × bronchopneumonia - although are distinct, in practice it is not important to distinguish them from each other.

Bacterial pneumonia

- Less common
- Causative agents: pneumococci, staphylococci (most often in the 1st year of life), streptococci, *Haemophilus*
- Risk factors - in aspiration, in immunodeficiencies, congenital lung anomalies, cystic fibrosis, ciliary dysfunction
- Clinical picture - sudden onset with fever, chills, lethargy, tachypnea, irritating cough, tachycardia
 - findings in infants may be minimal
 - percussion - dull
 - auscultation - bronchial breathing
 - in infants, the disease may not correlate with an X-ray finding

Aspiration pneumonia

- Often caused by lamp oils - acute inflammation with the dissolution of the pulmonary surfactant, leading to severe pneumonia
- Pneumonia caused by kerosene - in several days, ingested volatile substances are excreted, damaging the lungs.

Classification of pneumonia according to severity

- Mild pneumonia - no dyspnea, minimal symptoms
 - outpatient treatment (amoxicillin or clarithromycin)
 - without comorbidities
- moderate - dyspnea, marked auscultation findings, X-ray
 - usually initially hospitalized for 2-3 days, ATB i.v.
 - when the patient's condition improves, treatment continues on an outpatient basis
- severe pneumonia - hospitalization is necessary, sometimes with the need for mechanical ventilation.

Diagnosis of pneumonia

- Anamnesis - how long, where and how it started (rhinitis,...), whether onset was abrupt with fever or slow with lower temperatures, ask about aspirations
- X-ray, FW, KO, CRP
- **throat swabs are not significant for diagnosis**
- sputum is better for cultivation
- microscopy, culture, PCR (not for every case of pneumonia - expensive examination)
- blood culture (although about 80% of pneumonias are without bacteremia)
- bronchoscopy - very useful for the collection of materials
- antigen in urine - very sensitive, result in half an hour - for legionella and pneumococcus
- antigen in saliva - adenoviruses, RSV
- serology - debatable, takes a long time
- the clinical picture is determined by the basic health condition
- typical pneumonia - often have a productive cough from the beginning, crackles, bronchial breathing
 - X-ray, increased FW, high CRP, leukocytosis, left shift,
- atypical pneumonia - dry cough, extrapulmonary symptoms (fatigue, muscle pain), occasionally crackles
 - X-ray - interstitial reticulonodulation
 - High FW (higher than typical) - especially in mycoplasma infections - associated with cold Ig production
 - CRP slightly increased (up to 100)
 - lymphocytosis

Therapy

- Empirical antibiotic treatment of neonatal pneumonia:
 - ampicillin + gentamicin i.v. then ampicillin + cephalosporin III. generation i.v.
- Empirical antibiotic treatment of community-acquired pneumonia in infants **up to 3 months of age**:
 - cephalosporins III. generation i.v., then penicillin G i.v.
- Empirical antibiotic treatment of community-acquired pneumonia in children **from 4 months of age**:
 - mild pneumonia - amoxicillin p.o. (50-90 mg / kg / day in 3 doses),
 - severe pneumonia - penicillin G i.v. (100-200,000 IU / kg / day or more in 4-6 doses), in case of allergy, cephalosporin III. generation i.v. can be used instead.^[1]
- Symptomatic treatment:
 - expectorants, mucolytics, antitussives for irritating dry cough
 - antipyretics
 - oxygen therapy for respiratory insufficiency
 - nebulization therapy
- Regime measures:
 - adequate supply of fluids, calories, vitamins
 - respiratory rehabilitation.^[2]

Complications of pneumonia

- In the chest:
 - pleurisy - mainly in atypical pneumonia
 - lung abscess - S. aureus - ATB i.v - lincosamides are used for treatment, but often surgery is necessary
 - bronchiectasis - viral (adenoviruses) - to identify it, HRCT is necessary
 - empyema - rare in children
- septic complications (emboli - joints, heart, CNS,...).

References

Related articles

- Pneumonia (pediatrics) • Pneumonia • Pneumonia in older children
- Bacterial pneumonia • Atypical pneumonia • Abscessive pneumonia • Aspiration pneumonia
- X-ray examination in lower respiratory tract inflammation • Clinical evaluation of the severity of pneumonia

Source

-
- BENEŠ, Jiří. *Studijní materiály* [online]. [cit. 2010]. <<http://jirben.wz.cz>>.

Citations

1. LEBL, J, J JANDA a P POHUNEK. *Praktická pediatrie : Obvyklé diagnostické a léčebné postupy na Pediatrické klinice v Motole*. 1. vydání. Galén, 2008. 189 s. s. 28. ISBN 978-80-7262-578-9.
2. BABÁČKOVÁ, P. *Zdravotnické noviny : Pneumonie* [online]. Mladá fronta a.s., ©2007. [cit. 2011-02-03]. <<https://zdravi.euro.cz/clanek/priloha-lekarske-listy/pneumonie-287447>>.

