Pneumonia

Pneumonia is an acute or chronic inflammation of the lung parenchyma due to **infectious, allergic, physica**l or chemical **noxious agents**. It usually represents acute inflammation at the level of the respiratory bronchioles, alveolar spaces and interstitium. Globally, pneumonia is the third most common cause of death. The causative agent is recognised in at most 50% of cases. [1] [2] [3] Pneumonia is one of the **most common** inflammatory diseases.

Epidemiology

Pneumonia is particularly common in the first year of life, after which its incidence decreases. Between 80,000 and 150,000 pneumonias are reported annually in the Czech Republic, with a lethality of 10-20%. The lethality is increased by increasing age and associated polymorbidity, resistance agents, new agents (SARS), population migration, AIDS, drug addiction, air conditioning, ...[2]

Pneumonia is most often of infectious origin and is transmitted by droplet infection. They usually start with an upper respiratory tract infection, from where they spread to the bronchi and alveoli. Haematogenous spread occurs rarery[1]

Classification pneumonia

By the course of the disease

- **Acute**,
- **chronic** – inflammation lasting more than 3 months,
- **recurrent** – repeated inflammation in the same localization,
- **migratory** – pulmonary infiltrates migrate, appearing at different times in different parts of the lung.

By etiology

- **Infectious** – bacterial, viral, mycotic and mycobacterial, parasitic
- **non-infectious** (so-called "pneumonitis") – aspiration, inhalation, postradiation, soup, hypersensitive (allergic).

🔎 *For more information see Bacterial pneumonia, Atypical pneumonia, Lung tuberculosis.*

by clinic and epidemology [4]

Community-acquired pneumonia

The most common type of pneumonia, up to 90%, acquired in the normal environment outside a hospital setting. Mostly treated as outpatients, they are well sensitive to common ATBs.

The most common causative agents

- **G+** – *Streptococcus pneumoniae, Streptococcus pyogenes, Staphylococcus aureus*,
- **G-** – *Haemophilus influenzae, Klebsiella pneumoniae*.

Nosocomial pneumonia

1. **Early** nosocomial pneumonia develops in more than 48 hours after admission to hospital. The most common causative agents:

- **G-**: *Pseudomonas aeruginosa*, *Klebsiella pneumoniae, E. coli, Proteus vulgaris*;
- **G+**: *Staph. aureus*; anaeroby.

1. **Late-onset** nosocomial pneumonia develops after 4 days, G- causative agents are more common. **Therapy should be initiated empirically and as soon as possible**, each department knowing at least approximately its epidemiological situation, then adjusted on the basis of culture. In addition to the classical pathogens (Klebsiella, Enterobacteriaceae), opportunistic pathogens also appear (RS virus, CMV, Herpes zoster, Pneumocystis, mycobacteria). These agents cause pneumonia in **immunocompromised patients**. These are patients treated with cytostatics, radiation, post-transplant, HIV positive.

Pneumonia in immunocompromised patients

These are mainly HIV-positive patients, patients treated with cytostatics, immunosuppressants, radiation, after transplantation. Infection can be caused by known potential pathogens - Klebsiella pneumoniae, enterobacteria, Legionella, anaerobes. Opportunistic pathogens are also implicated in immunocompromised patients - CMV, RS

virus, herpes zoster virus, Pneumocystis jirovecii, mycobacteria.

Ventilator pneumonia

It arises in patients connected to a ventilator. It is a nosocomial pneumonia caused by microaspiration of microorganisms from the oropharynx and stomach. Antibiotic treatment is guided by the current epidemiological situation in intensive care units.

Pneumonia in social care institutions

It affects elderly polymorbid patients who frequently visit health care facilities; resistant strains are more common.

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Iron
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By the clinical and radiological picture

Typické (bacterial)

File:Pneumonie.jpg
Pneumonia in the right lower lung field.

X-ray examination of a patient with bronchopneumonia, inflammatory infiltrates evident.

They have the classic clinical symptoms of pneumonia (fever, cough and shortness of breath). They are caused by bacterial pathogens. On X-ray they appear as lobular, lobar, to alary pneumonia or bronchopneumonia, with exudate formation in the lung chambers.

In the blood count there is leukocytosis.

Atypical pneumonia

Difference between small-range X-ray and CT findings in Covid 19 They manifest with symptoms not typical for bacterial pneumonia (general "flu-like" symptoms - headache, muscle pain, joint pain, also nausea, vomiting). Radiological findings are consistent with disseminated pulmonary process.

the causative agents are characterized by intracellular parasitism.

The inflammation is interstitial, at the level of the wall of the lung chambers and the interstitium itself.

In the blood count leukopenia with relative lymphocytosis

By the mechanism of formation

- **Primary** – isolated pulmonary disability,
- **secondary** – complications of other systemic diseases.

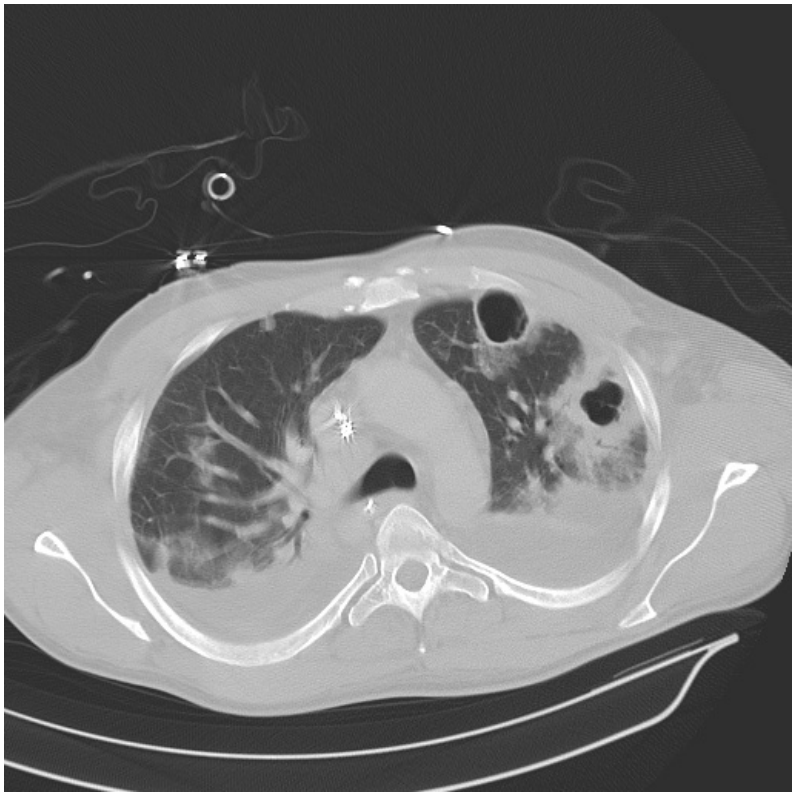
By the the pathological-anatomical picture

- **Alveolar** – inflammation mainly affects the lung chambers,
- '*Interstitial* – inflammation is localized in the bound connective tissue of the lung.

By the the X-ray findings

- **Alar** – the entire pulmonary wing is affected,
- **lobar** – one lobe affected,,
- **Segmental** – segment disability,
- **bronchopneumonia** – the infiltrate does not respect the anatomical arrangement of the lungs (lobe and segment boundaries).[2][5]

Diagnosis



- '*physical finding* – consolidation of lung tissue,
- '*Lung X-ray*,
- **microbiological examination of sputum** (preferably before ATB treatment, good quality sample) - Gram staining, culture, detection of antigens of S. pneumoniae, H. infuenzae, (only some serotypes), L. pneumophila, amplification methods (L. pneumophila),
- **hemoculture** – 2× before starting ATB treatment,
- **examination of an effusion** – biochemistry, cytology, Gram staining, culture, BK, MTD, detection of S. pneumoniae antigens,
- **urine examination** – detection of S. pneumoniae, L. pneumophila antigens,
- **serology** – in the acute phase only IgM, IgA antibodies,
- **blood count, FW, CRP, ABR, …**

Treatment

Antibiotics

Penicillin antibiotics , Tetracyclines and Macrolides group (at least 10 days for typical pneumonias, 14 days to 3 weeks for atypical pneumonias; 2 to 5 days intravenously). U nozokomiálních infekcí Cephalosporins III., IV. generation (cefotaxim, ceftazidim, cefepim), higher generation penicillin antibiotics (ticarcilin, piperacilin/ tazobaktam atd.), fluorochinolons, Carbapenems (imipenem, meropenem) or in combination with e.g. Aminoglycosides.

Symptomatic treatment

- Expectorants, mucolytics, in irritating dry cough antitussives,
- antipyretics,
- analgesics for pleural pain,
- oxygen therapy in respiratory insufficiency.

Nebulization therapy

Regime measures

- Sufficient intake of fluids, calories, vitamins;
- respiratory rehabilitation;
- orthopaedic position (in a slight prone position the patient puts less strain on the respiratory muscles and breathes better).

A pulmonary function test is indicated 6 weeks after resolution of pneumonia.[3]

Complications

- Respiratory insufficiency, pleural effusion, empyema, lung abscess, pulmonary gangrene, atelectasis and subsequent bronchiectasis,
- sepsis with dissemination of infection to other sites (arthritis, otitis, nephritis, endocarditis, meningitis,

peritonitis) to septic shock.[3]

Comparison table for typical and atypical pneumonia

Parametr	Typical pneumonia	Atypical pneumonia
Základní charakteristika	výrazný fyzikální nález	chudý fyzikální nález
Agens	(extracelulární) ***Streptococcus pneumoniae***, *Haemophilus influenzae Haemophilus parainfluenzae, Staphylococcus aureus, Klebsiella pneumoniae, Escherichia coli a Pseudomonas aeruginosa*	(intra/paracelulární) ***Mycoplasma pneumoniae***, *Chlamydophila pneumoniae, Chlamydophila psittaci, Legionella pneumophila Coxiella burnetii*, viry – RSV, influenzy, *Pneumocystis carinii*
Onset	Sudden	after HDC infection, slow
Ectopic symptoms	insipid	frequent - headache and muscle pain, vomiting, diarrhoea
Fever	septic febrilia	subfebrilia
Tremors	present	rarely
Cough	productive	dry, irritating
Heart rate	possible tachycardia	normal
The patient looks	Sick	'normal'
Physically	crepitus, tubular breathing, chrysalises	isolated chrysoprines
X-Ray	segmental/lobar opacification (alveolar involvement)	intestinal reticulonodulation (interstitial involvement)
Sedimentation	High	slightly elevated
Inflammatory markers	High	slightly elevated
Blood count	leukocytosis	Lymphocytosis
Treatment	Penicillin	Macrolides

Odkazy

Related articles

- Pneumonia (pediatrics) • [[Pneumonia in infants] • [[Pneumonia in older children]
- Bacterial Pneumonia • Atypical pneumonia • Abscessive pneumonia • Aspiration pneumonia • Community-acquired pneumonia
- RDG examination for inflammation of the lower respiratory tract • CURB-65 Score

External links

- Pneumonie (czech wikipedia)
- Pneumonia (english wikipedia)
- Pneumonia (video on YouTube) (https://www.youtube.com/watch?v=X-CnwZDXr9g)

Sources

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