Bronchiolitis

Template:Infobox - disease

Bronchiolitis is a severe acute obstructive respiratory disease characterized by edema the mucous membranes of small bronchi and bronchioles and increased mucus production caused by viral infection. A characteristic manifestation is acute respiratory distress with the rapid development of acute global respiratory insufficiency. It mainly affects children in the first two to three years of life. Boys are more often affected (up to 2 times more often). The highest frequency is in January to April (maximum in March). [1] [2]

The most common causative agent is RSV (*respiratory syncytial virus*). The disease most often affects infant in the first half of the year. The reason for the high incidence in infants is the fact that the antibodies or antibodies produced from the mother do not protect children against RSV during this period.

Risk groups: immature children, age up to 6 weeks, bronchopulmonary dysplasia, cystic fibrosis, immunodeficiency, congenital heart defects, DMP , systemic diseases.

The severity of the course worsens in children with other cardiopulmonary diseases, in immunodeficient and in congenital metabolic disorders.

Etiology

Common causes: RSV (85% of cases), influenza virus, parainfluenza virus, adenoviruses, rhinoviruses, Mycoplasma pneumoniae [1] a metapneumovirus.

Exceptionally bacteria are used: *Bordetella pertussis* , *parapertussis* , *Staphylococcus aureus* , *Haemophilus influenzae* , *Pseudomonas aeruginosa* , and other causative agents: *Chlamydia pneumoniae* , *Mycoplasma pneumoniae* .

Risk factors

- Age up to six months;
- low birth weight infants
- immaturity;
- bronchopulmonary dysplasia;
- cystic fibrosis;
- immunodeficiency;
- congenital heart defects or central nervous system.

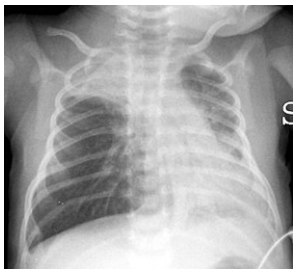
Clinical Presentation

1. phase - mild acute respiratory disease (rhinitis, cough, temperature 37−40 & nbsp; ° C), lasts for 1-7 days (prodromal period), [3]
2. stage - deterioration of the general condition - dyspnoea, tachypnoea, tachycardia, dyspnoea (jugular and lower jaw retraction), prolonged expiration, inspiratory chest position, cough, cyanosis (or pallor). Extreme tachypnoea (70-80 / min) dominates - similar in children to pneumocystosis.

Initially, *'mixed dyspnoea'* or an image similar to obstructive bronchitis (but does not respond to bronchodilators), pulmonary hyperinflation, and poor auditory findings predominate. Soon after, *'tachypnoea'* progresses and dyspnea develops (alar deflection, retraction of intercostal spaces, grunting...). Auditarily, there are inspirational cracks in the lungs in combination with indistinct expiratory screams and whistles. The increase in respiratory work gradually reduces muscle performance, followed by hypoventilation, *'cyanosis'* and *'global respiratory insufficiency'* . [2]

Diagnostics

- Clinical picture,
- listening finding,
- X-ray of the lungs - does not have a typical appearance (it can be done, but it does not have to); sometimes there is significant hyperinflation of the lungs with flattening of the diaphragm, multiple microatelectases of triangular shape, peribronchial infiltration, multiple microemphysemas, event. unilateral emphysema (Swyer-James syndrome), retrosternal and retrocardially increased lung transparency, localized pneumonia (especially in neonates and infants up to 6 months of age) [2] [3],
- Detection of RS-virus and adenoviruses after pharyngeal lavage (detection of RSV on tissue cultures and rise of fluorescent antibodies) [3],
- sweat test to rule out cystic fibrosis.



Thoracic X-ray of a 16-day-old child - marked hyperinflation of the lungs with flattening diaphragm, bilateral atelectasis in the right lung tip and in the left basal area.

Blood tests show uncharacteristic changes:

- leukocytosis - normal or even elevated (4-16 × 10 ^{9} / l) with mild lymphocytosis [3],
- ABR: hypoxemia, hypercapnia, respiratory acidosis.

Differential diagnosis

Important to distinguish from obstructive bronchitis, bronchial asthma, cystic fibrosis, tracheobronchial anomalies or foreign body aspiration. [1] Sometimes severe obstructive (asthmatic) bronchitis may have a similar picture during this period, but expiratory wheezes are present, so bronchodilators and corticoids have a greater therapeutic effect.

+ Comparison of acute bronchitis with & nbsp; acute bronchiolitis	-	**Flag**	**Acute bronchitis**	**Bronchiolitis acuta**	-	**Age**	at any time in childhood	infants and younger toddlers	-	**Occurrence**	spring, autumn	winter	-	**Etiology**	adenoviruses, influenza and parainfluenza viruses, chlamydia, mycoplasma	RSV (mostly), the rest as in bronchitis	-	**Dyspnoea**	expiratory	mixed	-	**Tachypnoea**	rarely	a

Therapy

- *'Oxygen therapy'* to keep oxygen saturation above 92%,
- *'rehydration and adjustment of the internal environment'* - do not overflow !, monitor the water balance, lifelong learning,
- *'calm'* , but adequately (do not muffle the respiratory center!),
- *'relocated'* to a workplace with the possibility of artificial lung ventilation,
- *'UPV'* in global respiratory insufficiency,
- controversial drugs:
  - corticoids - they are not usually effective - if they do not have an effect within 48 hours, we stop them,
  - β-mimetics - controversial - can have an effect, but they do not have to give if they do not help within 48 hours,
- other options with uncertain therapeutic effect:
  - inhalation of ribavirin antiviral, inhalation of adrenaline, parasympatholytics, gaseous mixtures of oxygen and helium [2],
- antibiotics are not recommended,
- *'bronchoalveolar lavage'* (BAL) - when we have it intubated, we help with mucus, cultivation,
- after *'the worst symptoms disappear'* - significant expectoration due to increased mucus production,
- *'breath rehabilitation'* .

Oxygen supply is necessary, sufficient hydration is necessary and in case of respiratory insufficiency mechanical ventilation. Furthermore, bronchodilators (β-mimetics) and corticosteroids are recommended (their administration is still controversial), as is the administration of ribavirin (antiviral). Evaluation of treatment: important assessment of gas exchange and tissue oxygenation (pulse oximetry), important examination of blood gases is important and ABR (detects hypercapnia - global respiratory insufficiency) - it is possible to prevent imminent respiratory failure. Worsening dyspnea, progressive hypoxemia, hypercapnia and apnea are indications for ICU admission and mechanical ventilation. ATB are indicated for bacterial superinfection (hemophilus, peumococcus) - in critically ill patients with high-temperature bronchiolitis and leukocytosis. [3]

Prognosis: mortality is low (2-4%). A higher incidence of wheezing and airway hyperresponsiveness is reported after bronchiolitis. [3]

Swyer-James / MacLeod syndrome

It is a finding of unilateral hyperlucent lung in the absence of other pathologies of the lung parenchyma (congenital lobar emphysema, emphysematous bullae, bronchogenic cysts, bronchiectasis). The main pathogenetic event is acute bronchiolitis with obliteration of the smaller airways, which usually leads to dilation and destruction of the lung parenchyma with air - trapping and hypoperfusion of the affected segment or lobe, manifested by radiographic hyperlucency. [4]

Prevention

Prophylactic administration of palivizumab (a monoclonal antibody against RSV) is recommended in selected high-risk groups of children with prematurity, heart disease or lung disease. It is given once a month for 5 months of the winter period, ie during the period of the highest frequency of RSV infections. Profit palivizumab balances its extreme price. Another form of prevention is the vaccination of all age groups against Influenza A. [4]

Links

Related Articles

- Acute bronchitis • Obstructive bronchitis • Recurrent bronchitis • Asthma

Reference

1. MUNTAU, Ania Carolina. *Pediatrics.* 4. edition. Prague : Grada, 2009. pp. 333-334. ISBN 978-80-247-2525-3.
2. NOVÁK, Ivan, et al. *Intensive care in pediatrics.* 1. edition. Galen, 2008. pp. 308-310. ISBN 978-80-7262-512-3.
3. HRODEK, Otto – VAVŘINEC, Jan., et al. *Pediatrics.* 1. edition. Prague : Galén, 2002. pp. 206. ISBN 80-7262-178-5.
4. HAVRÁNEK, Jiří: ' 'Parenteral nutrition' '

Source

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

- Lecture by MUDr. Petr Koťátek to medics on October 21, 2010.
- Seminar for medics with MUDr. David Lorenčík on October 21, 2010.