Comenius University in Bratislava
Faculty of Medicine

2nd Department of Pediatrics
Prof. MUDr. László Kovács, DrSc, MPH

Practical presentation before state exam

Student: **School year:**
Group: **Supervisor:** MUDr….

Patient's name: L.N.
Date of birth: 06.11.2011
Gender: Male
Hospitalization: 22.08.12 – 10.09.12

Family history: Patient has no brother or sisters. His father at the age of 5,5 years old overcame meningitis, his mother suffers from asthma. No other chronic diseases in the family were mentioned.
Personal history: Child of the first pregnancy. The pregnancy was without any complain. He was born at the 44th week of gestation with breech delivery. His birth weight was 3000 gr and his height was 48 cm. Mother had hepatitis C, and was positive for HbsAg so intrapartum prevention was necessary. At the 7th month of age patient was examined for hepatitis-C but the anti-HCV test was negative. The breastfeeding period was short. Vaccination was done according to the routine Slovak Republic Schedule. He was hospitalized on 02/2012 and on 06/2012 diagnosed both times with obstructive bronchitis. He has never undergone any operation, while no injury has been reported. He was not infected by varicella and he did not come in contact with any infected person.
Social anamnesis: Social case
Allergic anamnesis: Allergies to medications, food-stuff or other substances have not been reported.
Drug history: Patient received Vigantol , Ventolin spray from 20.8.12 until 22.08.12 at 11:00 o'clock daily.
Present complain: 9,5 month old child was admitted with recurrent obstructive bronchitis occurring for second time. Last time was hospitalized in July and was dismissed on 18.07.12. On 22.08 he was admitted being already four days sick with cough, decreased respiratory rate and afebrile state until the date of admission. His mother mentioned that the inhalation of prescribed ventilon did not improve the condition. Dyspnoe is worsening during night time. The day of admission (22.08.12) was hospitalized with objective findings of obstructive bronchitis without dyspnoe. He is eating and drinking without difficulties while no vomiting and diarrhea have been reported and his urination is done without difficulties.

Vital signs:

- **Temperature:** 37,8°C rectal
- **Heart rate:** 136/ min
- **O2 saturation:** 98%
- **Respiratory rate:** 28/min
- **Weight:** 9.450 gr
- **Lenght:** 73 cm

Status present generalis: 9,5 month old boy, conscious, eutrophic with productive cough without signs of dehydration. In the skin red macules of size up to 1 cm are present due to mosquito bites. Turgor is normal. Also did not present any sign of icterus or cyanosis. They were no skeletal deformities. The musculature is normotrophic but hypotonic. Patient is psychomotoric retarded and sitting is done only with assistance.

Status present localis: Head: Shape of the head is plagiocephalic. No scar was detected during inspection. Big fontanelle size is 0,5x1 cm **Face**: The eyes are symmetrical, without any sign of strabismus. There was no edema in the eyelids. The conjunctiva is pink without any inflammation. Bulbs are at median position with moving ability to all directions. The sclera is white without signs of jaundice. Pupils are isocoric. Direct and bilaterally photoreaction is consensual. There is normal bilateral innervation of the facial nerve (7^{th} cranial nerve) . The patient was able to smile symmetrical while no muscle weakness was detected during facial expression. Ears and nose do not present either discharge nor deformity. **Oral cavity**: The mucous membrane is pink and well hydrated. The tongue is pink without any signs of dehydration or inflamation or presence of mucous plagues. Tonsils were symmetrically medium - sized without signs of inflammation (redness and edema). Orophanx did not present neither any sign of inflammation. **Neck:** The neck was slim, symmetric with painless palpable lymph nodes extending up to 1 cm. **Chest:** Symmetrical, with epigastric retraction during breathing. Auscultation reveals prolonged expiration, wheezing and expiratory stridor. During heart auscultation, 3^{rd} heart sound was audible. No heart murmur was audible. **Abdomen:** The abdomen is symmetrical without any detectable protrusion and at the same level with the chest . The abdomen is soft and non-resistant during palpation without any pain and tenderness . The percussion sound was tympanic. There is no organomegaly (hepatomegaly, splenomegaly). During palpation any palpable mass was detected. Tappotment examination was negative. **Limbs:** they were symmetrical without any sign of deformity, edema, without any movement limitation. Pulsation of femoral arterias is palpable bilaterally. **Genital:** Male genitals without inflammation. The testis presented inside the scrotum bilaterally. Also phimosis presented. Tanner examination reveals pubarche in first stage and gonadarche in first stage.

Laboratory tests

Complete cell count:	**value**
Leukocytes	11,1* 10^3/ul
Erythrocytes	4.25*10^6/ul
Hemoglobin	11.3 g/dl
Hematokrit	**32.8%**
MCH	26.6pg
MCV	77.2 fl
Lymphocytes%	60,6
Thrombocytes	**442*10^9/l**
MXD**%**	13.2%
Neutrophils%	26.2%
MXD#	1.5*10^3/ul
Neutrophil#	2.9*10^3/ul
Lymphocytes#	6,7*10^3/ul

Biochemical results	**Value**

CRP	4 mg/dl
ALT	0,44 ukat/l
Creatinine	20 umol/l
Glucose	5,6 mmol/l

Substrates	**value**
Urea	3,6 mmol/l
Uric acid	211 umol/l

Ions	**Value**
Na	141 mmol/l
K	4,98 mmol/l
CL	104 mmol/l

Urinalysis	**Result**
PH	7,0
Proteins	+
Glucose	Negative
Urobilinogen	Negative
Bilirubin	Negative
Ketone bodies	Negative
Erythrocytes	Negative
Leukocytes	Negative
Nitrates	Negative

Urine sedimentation	**value**
Erythrocytes	1-3
Leukocytes	7-9
Bacteria	Positive
Amorphous salts	Positive
Mucous fibers	Positive

Acid base	**Value**	**Control next day**
pH	7,38	7,43
pCO2	**3,7**	**3,6** kPa
BE	**-7,1**	**-5,0** mmol/l
HCO3 act	**16,2**	**17,6** mmol/l
pO2	8,9	8,8 kPa
sat. O2	93	94%

Cultivation results:

Sample from tonsil: alfa-hemolytic strptococcus, non-pathogenic, Neisseria, Staphylococcus species
Sample from nose: ampicillin resistant Staphylococcus Aureus

Other examinations
Stool examination: Rotavirus : positive
Adenovirus : negative

Diagnosis:
The patient suffers from recurrent obstructive bronchitis as well as rotavirosis.

Differential Diagnosis:

- *Bronchial asthma*
- *Pneumonia*
- *Pertussis*
- *Foreign body aspiration*
- *Cystic fibrosis*
- *Tracheo/laryngomalacia*

Therapy:
Therapy should be primarily supportive:
Bronchodilators : salbutamol -β2 adrenergic receptor agonists (Ventolin).
Ipratropium bromide-anticholinergic (Atrovent).
Pain relief medication: Ibuprofen (Nurofen)
Steroids local and systemic:: Flixotide, Solumedrol
Probiotics.
Diet for rotavirosis.
1/1 normal saline.

Conclusion:
9,5 month-old psychomotoric retarded boy was admitted to the hospital with recurrent obstructive bronchitis, with signs of dyspnoe with ausculatory signs resembling obstructive bronchitis. In laboratory tests low inflammatory activity was observed. Patient was treated with inhaled bronchodilatory therapy, but in initially system intravenous administration of corticosteroids was required. After treatment breathing was adjusted. During hospitalization patient was febrile with ongoing acute enteritis. Parenteral rehydration was not required since diet therapy was sufficient for the improvement of the patient's situation. After treatment patient is afebrile and in good clinical condition.

OBSTRUCTIVE BRONCHITIS IN PEDIATRIC PATIENTS

Introduction:

Acute bronchitis is a clinical syndrome produced by inflammation of the trachea, bronchi, and bronchioles. In children, acute bronchitis usually occurs in association with viral respiratory tract infection. Acute bronchitis is rarely a primary bacterial infection in otherwise healthy children. Chronic bronchitis is recurring inflammation and degeneration of the bronchial tubes that may be associated with active infection. Patients with chronic bronchitis have more mucus than normal because of either

increased production or decreased clearance. Coughing is the mechanism by which excess secretion is cleared.

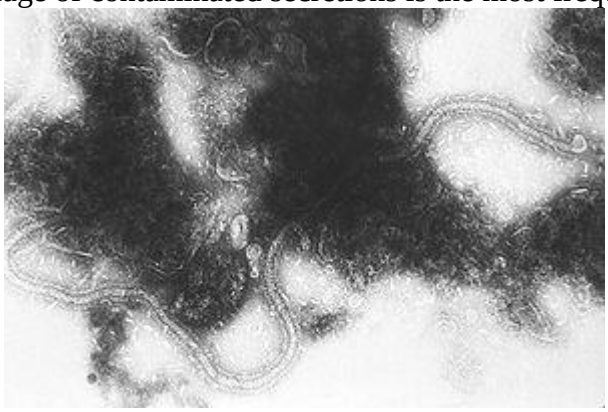
Infants and toddlers with bronchitis have increased risk for obstructive bronchitis due to inflammatory changes that occur as edema, hyperaemia, mucous hypersecretion and bronchospasm. Wheezing during the expiratory phase is characteristic and is the result of airway obstruction. Obstructive bronchitis may also be associated with immunological deficiency due to the youth of age. Other associations include diet, fetal and postnatal exposure to tobacco, and a family history of allergies.

Epidemiology:

It's a quiet common condition in the first two years of life with a peak age at 2-6 month. The incidence falls rapidly between the ages of 1 and 5 years, after which the disease is uncommon. It is estimated that only 10% of healthy children with obstructive bronchitis and wheezing require hospitalization. The male to female ratio is 2:1 while epidemics occur from November to April.

Etiology :

RSV is the primary cause, followed in frequency by human metapneumovirus, parainfluenza viruses, influenza viruses, adenoviruses, rhinoviruses, and, infrequently, *M. pneumoniae*. Viral form is extremely contagious and is spread by contact with infected respiratory secretions. Although coughing does produce aerosols, hand carriage of contaminated secretions is the most frequent mode of transmission.



Human respiratory syncytial virus

Clinical features:

a. *Symptoms*

RSV associated disease has an incubation period of 4 to 6 days. Bronchitis classically presents as a progressive respiratory illness that is similar to the common cold in its early phase with cough, coryza, and rhinorrhea. It progresses over 3 to 7 days to noisy, raspy breathing and audible wheezing. There is usually a low-grade fever accompanied in young children by irritability, which may reflect the increased work of breathing and may increase itself with increased respiratory effort. In contrast to the classic progression of disease, young infants infected with RSV may not have a prodrome and may have apnea as the first sign of infection.

b. *Physical signs*

They include tachypnea, expiratory stridor,,prolonged expiration,proflaring of the alae nasi and occasionally cyanosis. Expiratory wheezes are characteristic while liver may appear enlarged due on palpation due to diaphragm depression resulting from hyperinflation of the lung.

Diagnosis:

Routine laboratory tests lack specificity for diagnosing bronchitis and are not required to confirm the diagnosis. A mild leukocytosis of 12,000 to 16,000/μL is encountered frequently but is not specific. In severe cases of bronchitis, it is important to assess gas exchange. Visual assessment of oxygenation correlates poorly with actual blood gas values. Pulse oximetry is generally adequate for monitoring oxygen saturation. Frequent, regular visual assessments and cardiorespiratory monitoring of infants are necessary because respiratory failure may develop precipitously in very tired infants even though blood gas values taken before rapid decompensation are not alarming.

Antigen tests (usually by immunofluorescence or ELISA) of nasopharyngeal secretions for RSV, para-influenza viruses, influenza viruses, and adenoviruses are the most sensitive tests to confirm the infection. Rapid viral diagnosis also is performed by PCR and is helpful for cohorting children with the same infection.

The chest radiograph frequently shows the signs of hyperexpansion of the lungs, including increased lung radiolucency and flattened or depressed diaphragms although may appear normal.

Differential diagnosis:

The major difficulty in the diagnosis of obstructive bronchitis is to differentiate other diseases associated with wheezing. It may be impossible to differentiate asthma from obstructive bronchitis by physical examination, but age of presentation, presence of fever, and no history (personal or family) of asthma are the major differential factors. Asthma usually presents in older children with wheezing episodes that usually are not accompanied by fever unless a respiratory tract infection is the trigger for the asthma attack.

Wheezing also may be due to other causes, such as a foreign body in the airway, congenital airway obstructive lesion, cystic fibrosis, exacerbation of bronchopulmonary dysplasia, viral or bacterial pneumonia, and other lower respiratory tract diseases.

Cystic fibrosis is associated with poor growth, chronic diarrhea, and a positive family history. A focal area on radiography that does not inflate or deflate suggests a foreign body.

Therapy:

- Treatment is primarily supportive with nasal bulb suctioning, hydration and oxygen as needed.
- Bronchodilators are controversial and may only be effective in up to 50% of patients
- Steroids are also controversial and may be effective in patients with a prior history of wheezing.
- Ribavirin is an antiviral agent that can be used for the treatment of severe cases. It’s use is limited to hospitalazed patients that the cause is the RSV virus.

- Hospitalisation is indicated for respiratory distress, hypoxemia, apnea, dehydration or underlying cardiopulmonary disease.

Prevention:

RSV monoclonal antibody (palivizumab) may be given prophylactically by monthly intramuscular injection during RSV season to prevent severe disease in infants with a history of prematurity, chronic lung disease, cyanotic or hemodynamically significant congenital heart disease.

Complications:

Most hospitalized children show marked improvement in 2 to 5 days with supportive treatment alone. The course of the wheezing phase varies, however. There may be tachypnea and hypoxia after admission, progressing to respiratory failure requiring assisted ventilation. Apnea is a major concern for very young infants with obstructive bronchitis.

Prognosis:

Most cases resolve completely, although minor abnormalities of pulmonary function and bronchial hyperreactivity may persist for years. Recurrence is common, but tends to be mild, and should be assessed and treated similarly to the first episode. The incidence of asthma seems to be higher for children hospitalized for bronchitis as infants, but it is unclear whether this is causal or if children prone to having asthma are more likely to be hospitalized when they develop obstructive bronchitis. There is a 1% to 2% mortality rate, which is highest among infants with preexisting cardiopulmonary or immunologic impairment.

Referrences:

- WATTS, K., GOODMAN, D. Wheezing, Bronchiolitis, and Bronchitis. In Nelson Textbook of Pediatrics. 18th ed. Philadelphia: Saunders, Elsevier, 2007. ISBN: 978-1-4160-2450-7, pg.687-688.
- LAUREN J.WITCOFF.Infectious disorders of respiratory tract.In Loyd J. Brown, Lee T.Miller Pediatrics.2nd ed. 2005.ISBN 0-7817-2129-6, pg. 259-267.
- JON COURIEL. Respiratory disorders.In Lissauer's Clayden's Illustrated textbook of pediatrics.2nd ed. 2001. ISBN: 0723431787 pg. 220-221.
- PATRICK L CAROLAN, MD Adjunct Associate Professor, Departments of Pediatrics, Family Practice, and Community Health, University of Minnesota Medical School. Article on Pediatric Bronchitis on the site Medscape.com (http://emedicine.medscape.com/article/1001332-overview).