

## Course 8

- Management of respiratory diseases in the practice of the family doctor

### **Acute upper respiratory tract infections**

Incidence of acute rhinitis and rhinopharyngitis according to age

- children 3-8 per year
- teenagers 2-4 per year
- over 60 years - 0-1 per year

Among patients with upper respiratory viral infections

- 80% have changes in the paranasal sinuses
- 2% is complicated by bacterial sinusitis

Epiglottitis is more common among

- 2-7 years

Complications of upper respiratory tract infections

- otitis media
- acute bronchitis] acute bronchitis
- pneumonia
- sepsis
- meningitis
- pulmonary abscess
- intracranial abscess

Pharyngitis with group A beta hemolytic streptococcus can be complicated with

- acute glomerulonephritis
- paraamygdalian abscesses
- toxic shock syndrome

Sinusitis can be complicated with

- periorbital cellulite
- subperiosteal abscess
- orbital abscess
- frontal osteomyelitis
- maxillary osteomyelitis
- subdural abscesses
- meningitis
- brain abscess

The 3 most common agents that cause bacterial overinfection of acute sinusitis:

- streptococcus pneumoniae
- Haemophilus influenzae
- Moraxella catarrhalis

The involvement of group A beta hemolytic streptococcus in acute pharyngitis in adults is 5-15%

An incubation period of 1-5 days is specific for rhinoviruses and group A streptococcus

An incubation period of 1 week is specific for respiratory syncytial virus

An incubation period of 7-10 days, maximum 21 days (3 weeks) is specific for the bacillus pertussis

An incubation period of 4-6 weeks (1 month) is specific for Epstein-Barr virus

### **Acute viral rhinopharyngitis**

Symptoms

- rhinorrhea
- congestion
- nasal obstruction
- sneezing
- sore throat
- cough

It can be associated

- fever below 39 degrees Celsius (sometimes)
- hyposmia
- headache, fatigue, conjunctivitis
- chills, asthenia, myalgia
- nausea, vomiting, diarrhea

Incubation period

- 2-3 days

Duration of symptoms in acute viral rhinopharyngitis

- in the child 6-9 days (1 week)
- in adults 3-14 days (2 weeks)

## Acute pharyngitis

### Etiology

- Atypical bacteria in acute pharyngitis are:
- *Mycoplasma pneumonia*
- *Chlamidia pneumoniae*
- anaerobic germs

### Physical examination in acute viral pharyngitis

- erythema of the pharynx
- secretions (they can also be mucopurulent)
- ulcers, erosions or blisters
- tonsil hypertrophy
- anterior cervical adenopathy (occurs in both viral and bacterial pharyngitis)

### Physical examination in streptococcal pharyngitis

- erythema
- secretions
- tonsil hypertrophy
- anterior cervical adenopathy (over 1 cm)
- ulcers and erosions are missing

### Bacterial etiology of pharyngitis is suspected when

- the symptoms persist for more than 10 days
- the symptoms worsen after the first 5-7 days (1 week)

### Antistreptolysin O

- recommended for the detection of streptococcal infections
- has no diagnostic role in acute pharyngitis
- high values persist 4-5 weeks after the onset of pharyngitis

### Group A betahemolytic streptococcal treatment

- Amoxicillin 1 g at 8 hours 7-10 days
- Clindamycin 300 mg at 8 hours 7-10 days
- Clarithromycin 1g / day 7 days
- Azithromycin 500 mg / day 5 days

### Complications of pharyngitis with betahemolytic streptococcus

- local
- tonsils abscess  
sinusitis  
otitis media  
cervical lymphadenitis

- remote septic pneumonia
- meningitis
- endocarditis
- sepsis
- late complications
- acute articular rheumatism
- acute glomerulonephritis

## **Acute sinusitis**

In acute bacterial sinusitis, the most common etiology is streptococcal pneumoniae - 30-66% of cases

Other causes

- Group A streptococci
- Moraxella
- Chlamydia
- anaerobic
- fungi

The clinical picture is characterized by

- pain in the face
- spontaneous
- when the sinus points are felt
- hyposmia
- purulent nasal secretion
- nasal obstruction
- vertigo

X-ray of the sinuses

- opacification of the sinuses
- hydropneumonic levels (sometimes)

ENT examination

CT, MRI

sinus puncture or endoscopic lavage with bacteriological examination

Treatment in uncomplicated cases

- oral antibiotic therapy
- Amoxi or Ampicillin 2 g / day
- cephalosporins
- Macrolides
- quinolones

The time for antibiotic treatment in sinusitis is around 2 weeks

#### Complications

- osteomyelitis of the face
- mucocele secondary to prolonged ductal obstruction
- cavernous sinus thrombosis
- meningitis
- brain abscess

#### **Laryngotracheobronchitis (croup)**

- has a maximum incidence in the second year of life
- more frequent between 6 months and 4 years
- it is often endemic
- it can also be found in adults

#### The clinical picture

- fever
- dysphonia
- dysphagia
- stridor
- stridor
- spastic cough sprain
- "suffocation"

#### Treatment

- hospitalization

#### **Flu**

##### General events

- fever, chills
- headache, physical asthenia
- myalgia, curvature
- cracks, vomiting
- nasal catarrh (not a general manifestation)
- ocular catarract (not a general manifestation)

- Influenza viruses are
- 3 types (A, B, C)

Incubation period: 1-3 days

## Complications

- respiratory
  - acute laryngeal-traheo-bronchitis
  - acute pneumonia
  - exacerbations of asthma and COPD
  - acute bronchiolitis
  - sinusitis
- cardiovascular
  - acute myocarditis
- neurological
  - encephalitis
  - myelitis
  - polyneuropathy
  - neuritis
  - Reye sdr.

Reye sdr., a complication of the aspirin-treated flu, appears in children between 2-16 years

## Treatment

- uncomplicated forms
- symptomatic
- bacterial superinfection: antibiotic therapy
- amantadine, rimantadine (antiviral)

The age at which influenza prophylaxis can be done through seasonal vaccination is 6 months

## **Pneumonia**

- In most cases of pneumonia, the therapy is empirical because pathogens are difficult to identify

Etiology in the immunocompromised patients

- CMV
- Myalgia and arthralgia from community pneumonia are characteristic for pneumonia with atypical germs

The atypical germs in the etiology of community pneumonia are

- Mycoplasma pn.
- Chlamidia pn

- Legionella
- Burneti Coxiella
- Bordetella pertussis

- In particular, an elderly patient may have symptoms that may mimic stroke

Physical examination

- dullness
- crackling rales
- sub-repeating rallies

Radiography of a person with community pneumonia

- Lobar opacity is specific for pneumococcal pneumonia
- Interstitial opacity is specific for pneumonia with Mycoplasma pn.
- multilobar, bronchopneumonic or cavity opacity is specific for staphylococcal pneumonia, pneumonia with Gram-negative germs

Sometimes the typical condensation image is delayed, especially in dehydrated patients

It is recommended to repeat lung Rx

- after treatment (in general)
- when evolution is dragging
- when new signs appear (eg. pleural effusion)

## **Viral pneumonia**

The characteristic radiological aspect of viral pneumonia is interstitial type

Varicella pneumonia

- 1-6 days after the eruption
- or just before
- is the most serious complication of varicella in adults

Rx

- bilateral, diffuse, reticular or nodal infiltrates
- sometimes liquid discharge
- lymphadenopathy

Pneumonia from measles

- a few days after the skin rash

Rx

- mixed opacities with lattice and condensation areas
- hilar adenopathies
- lobular or segmental condensation in superinfection

### **Pneumococcal pneumonia (*Streptococcus pneumoniae*)**

*Streptococcus pneumoniae* is a common cause of pneumonia especially in the following categories

- <2 years
- > 65 years old
- patient with chronic diseases
- patient with immunodepression (DZ, IC, hepatopathy, COPD, HIV, alcoholism)

Associated symptomatology

- myalgia
- cracks, vomiting

### **Pneumonia with gram-negative germs**

- *Klebsiella pn.*
- *Pseudomonas aeruginosa* (Pseudomonas)
- *Haemophilus influenzae*

Clinical picture

- severe

Rx in *Pseudomonas* and *Haemophilus* pneumonia

- bronchopneumonia type
- with a tendency to abdicate

*Haemophilus* swelling is most commonly seen in patients with

- COPD
- (smokers)

Rx in pneumonia with *Haemophilus infl.*

- segmental or lobar condensation
- appearance of bronchopneumonia
- parapneumonic pleurisy

### **Pneumonia with atypical germs**

- Myc, Chl, Leg



### Pneumonia with Myoplasma pn

- moderate clinical form
- it can be treated as an outpatient
- frequent extrapulmonary manifestations
- Rx: Accentuated bowel

### CMV pneumonia

- appears only in immunocompromised patients

### Hospitalization for pneumonia is recommended in the following cases

- patient with high risk of morbidity and mortality
- advanced age
- Neuro-psychic disorders
- Hemodynamic disorders
- High-risk pathogens (Pseudomonas) - probably methicillin-resistant MRSA staphylococci
- advanced chronic diseases (cancer, diabetes)

For outpatient treatment, it is interesting if the patient has received antibiotics in the last 3 months

### Patients not treated with Atb in the last 3 months

- Clarithromycin 2 x 500 mg 7 days
- Azithromycin 500 mg / day 5 days

### Treatment with antibiotics in the last 3 months or with comorbidities

- fluoroquinolone
- moxifloxacin 400 mg / day
- levofloxacin 750 mg / day
- betalactamine
- Amoxicillin 3 x 1g / day
- Amoxi / Clavulanat 2 x 1-2 g / day
- Ceftriaxone 1-2 g i.v.
- Cefuroxime 2 x 500 mg / day

### Pharmacological treatment of viral pneumonia

- ex. bird flu
- Oseltamivir - Tamiflu
- plus Amantadine, Rimantadine

## **Pulmonary tuberculosis**

Factors that predispose to tuberculosis

- crowded communities (schools, hospitals, prisons)
- malnutrition
- alcoholism
- drugs i.v.
- HIV (HIV has a 400-fold higher risk of TB infection than the general population)

Infection progression to active disease

- Starting with tuberculosis, the active disease appears at a rate of 10% (maximum)

The latent infection has the following evolution

- IDR positive at 3-8 weeks
- erect nodes
- hematogenous dissemination at 1-3 months
- bronchial tuberculosis - v < 5 years - at 3-7 months
- pleurisy - v > 5 years - at 3-7 months
- osteoarticular tuberculosis, other forms - at 1-3 years

Rx

- lobar infiltrate
- segmental infiltrate
- especially in the upper lobes, the posterior segments
- cavities
- bronchiectasis
- pneumonia
- bronchopneumonia

The only pathognomonic way for diagnosis is

- bacteriological examination from sputum (direct and cultures)

Other possible examinations

- examination of the plural fluid
- identification of microbial nucleic acids (PCR)
- Quantiferon - measurement of interferon gamma released by activated lymphocytes
- Pulmonary Rx

The gold-standard confirmation of active tuberculosis is

- culture on specific environments
- Lowenstein-Jensen environments
- sensitivity 75-80%
- 99% specificity
- allows diagnosis in paucibacillary form ( $<100$  BK / ml)
- the result comes late - after 4-6 weeks

Other investigations

- direct microscopic ex
  - requires a large amount of bacilli (10,000 BK / ml)
  - cannot differentiate between tuberculous and non-TB mycobacteria
- culture on BACTEC liquid media
  - result in 7 days
  - antibiogram 2-3 weeks

The major determinant of therapeutic success = therapeutic compliance

Other principles of treatment

- drug combinations are used (to avoid chemoresistance)
- long-term treatment
  - 2/7 or 3/7 therapeutic scheme
  - total treatment duration 6 months
    - 2 months triple or quadruple association
    - then 4 months INH and RMP
  - in the treatment of TB with negative cultures
    - 4 months INH and RMP
  - in the treatment of extrapulmonary TB
    - 12 months
- Antibiogram is mandatory at the beginning of treatment
- In case of failure of the initial therapy, add at least 2 new drugs

## **COPD**

The most important risk factor in the etiopathogenesis of COPD = smoking

Other factors

- professional exposure
- indoor pollution - domestic heating using wood or coal
- outdoor pollution
- antitrypsin deficiency

The risk of developing the disease depends on

- No. of packages - year ( $> 20$  UAN - units of packages)
- duration
- age of onset of smoking
- sex (women are more sensitive)

The gold standard for dg. COPD

- spirometry

Other investigations

- plethysmography (explores CPT, is used in uncooperative patients for spirometry)
- the alveolo-capillary diffusion capacity
- gasometers
- Pulmonary Rx

Airway obstruction is defined by

- VEMS  $< 80\%$  of the predicted value
- VEMS / CVF  $< 70\%$  of the predicted value

Reversibility test

- short-acting bronchodilator
- there is no significant reversibility
- VEMS increases by less than 12%

COPD classification (GOLD guide)

- stg I - VEMS / CVF  $< 70\%$ , VEMS  $> 80\%$
- stg II - VEMS  $< 80\%$
- stg III - VEMS  $< 50\%$
- stg IV - VEMS  $< 30\%$  plus IRC

Exacerbations are given by

- infectious agents - bacteria, viruses
- physical effort
- pollutants

The objectives of the COPD management

- improvement of symptoms
- prevention of disease progression
- improving tolerance to effort
- improving the health status
- prevention and treatment of complications

- prevention and treatment of exacerbations
- decreased mortality

### Prophylaxis

- identification and reduction of exposure to risk factors
- patient education
- prevention of exacerbations and complications

The main prophylactic measure in COPD = combating smoking

### Non-pharmacological treatment

- identification and reduction of FR
  - combating smoking
- patient education
  - addresses the patient
  - addresses the family
  - nature of the disease
  - evolution
  - risk factors
  - principles of treatment
  - use of therapeutic devices

### Pharmacological treatment

- bronchodilator inhaler or semen
- inhaled / systemic corticosteroids
- administration of antioxidant and mucolytic agents
- influenza and pneumococcal vaccination

### Exacerbation management

- Inhaled bronchodilator with short duration of action
  - salbutamol 2 puff at 4-6 hours
  - in case of an unfavorable answer
    - bronchodilator from other classes
    - inhaled anticholinergic (ipratropium bromide 2-6 puffs at 6 h
    - oral methylxanthines (see GOLD)
- for stages 3 and 4
  - oral corticosteroid is associated
    - prednisone 30-40 mg / day
    - methylprednisolone 24-32 mg single dose morning 10-14 days

### In case of bacterial infection (sputum with purulent appearance)

- oral antibiotic therapy 7-10 days
- in the absence of FR

- Amoxi 2-3 g / day
- Amoxi + Clavulanic Ac. 2 x 1 g / day
- Cefuroxim 2 x 500 mg / day
- Clarithromycin 1 g / day

#### Hospitalization criteria (GOLD)

- uncertain diagnosis
- old age
- significant comorbidities (diabetes, CVD)
- severe COPD
- intensification of symptoms - sudden onset of resting dyspnea
- the appearance of new signs: cyanosis, arrhythmias, peripheral edema
- frequent exacerbations
- insufficient support at home

#### The role of the family doctor in the diagnosis and management of COPD

- identification of patients at risk
- early diagnosis of the disease
- guidance to the specialist doctor
- patient monitoring

#### Chronic evaluation

- assessment of treatment compliance
- evaluation of the technique of administration of inhaler devices
- referral to the specialist for reassessment at intervals of 3-6-12 months
- referral to a specialist in case of exacerbation

#### Risk factors for severe evolution

- debut <40 years
- Severe COPD
- exacerbations > 2 / year
- rapidly progressive evolution
- long-term oxygen therapy
- the onset of other comorbidities
- possible surgical indications with reduced lung volumes

### **Bronchial asthma**

#### Factors that increase the risk of asthma

- maternal smoking
- duration of pregnancy
- some complications during pregnancy
- allergenic exposure early in life

- artificial nutrition
- western type food (processed foods)
- some vaccinations
- some viral infections in childhood (respiratory syncytial virus)
- obesity
- sedentary

Factors that aggravate the evolution of the disease or cause exacerbations

- allergenic exposure
- smoking
- weather conditions (fog, cold, humidity, wind, storm)
- respiratory infections
- physical exertion and hyperventilation
- aspirin or other medicines
- food and food additives
- strong emotions
- GERD

Suggestive symptoms for asthma

- paroxysmal dyspnea
- irritant cough
- sensation of chest constriction
- wheezing

The probability of asthma diagnosis is higher in the presence of the following characteristics

- seasonal variability
- day to day variability
- daytime variability
- aggravation at night
- aggravation in the first hours of the morning
- appearance by triggering factors
- improvement after anti-asthmatic treatment

The gold standard for paraclinical asthma diagnosis is spirometry

Other investigations

- the bronchial challenge test for methacholine / histamine (the result is expressed in the dose of the substance that causes VEMS decrease by 20%)
- PEF measurement
- pulmonary radiography
- the stress test

### Reversibility

- after administration of bronchodilators with short duration of action
- VEMS increases by more than 12% or 200 ml from the initial value

### Classification according to the degree of control

- Controlled:
  - no symptoms at night
- Partially controlled:
  - no nighttime symptoms
  - less than 80% of lung function
- Uncontrolled

### Status of asthmaticus

- a severe form of exacerbation
- sudden onset - allergens, emotions
- progressive onset - viral infections

### Asthma control is defined by the following characteristics

- absent or minimal daytime symptoms (no more than twice a week)
- absence of limiting activity and nocturnal symptoms
- exacerbations absent or rare
- minimal or no use of rescue medication (beta 2 agonists)
- circadian variation of PEF below 20%
- normal or near normal PEF
- adverse reactions of absent or minimal anti-asthmatic therapy

### Patient education

- addresses the patient, addresses the family
- nature of the disease
- evolution
- risk factors
- principles of treatment
- use of therapeutic devices

### When is the patient sent to the specialist?

- reassessment at 3-6 months
- spirometry - annual
- for the evaluation of comorbidities
  - COPD (asthma + COPD = ACOS syndrome, asthma / COPD overlap syndrome, Asthma COPD Overlap Syndrome)
  - viral bronchiolitis in children
  - chronic resuscitation
  - GERD



- uncontrolled asthma in step 3
- asthma controlled in step 4 or 5 - at 3 months
- frequent exacerbations
- particular forms of asthma

#### Particular forms of asthma

- corticoreistant asthma
- corticodependent asthma
  - due to
    - diagnostic errors
    - treatment errors
    - noncompliance with inhalation therapy
- chronic asthma with fixed obstruction (continuous need for rescue medication - beta 2 agonists or anticholinergics)
  - due to association
    - beta blockers
    - ACE inhibitors
- occupational asthma

#### Exacerbation management

##### Non-severe exacerbations

- PEF reduction by <20%
- nighttime symptoms
- increasing the use of rescue medication
- It can be treated as an outpatient if
- there are no medical or psychosocial risk factors

#### Treatment

- beta 2 agonist 2-4 fluffs in 10-20 minutes
- the answer is evaluated at 20-40-60 min
- in the case of a favorable answer, no hospitalization is necessary
- referral to a specialist
- short-term oral corticosteroids

#### Severe exacerbations

- did not respond to the initial bronchodilator therapy
- requires hospitalization
  - oxygen
  - beta 2 agonist through nebulization
  - anticholinergic inhaler
  - prednisone 40-60 mg
  - HHC iv. 200-300 mg

Exacerbations that are life threatening

- PEF does not increase more than 50%
- SaO<sub>2</sub> <90%
- requires hospitalization
  - treatment as severe exacerbations
  - plus a bronchodilator (ipratropium)