

# Therapy of asthma attack bronchiale/PGS (VPL)

## Exacerbation of an attack of bronchial asthma

Exacerbation of asthma (= asthma attacks):

- these are states:
  - **progressive worsening of shortness of breath, cough, wheezing, chest tightness** or
  - a **combination** of these symptoms.

## Variability

Bronchial asthma:

- highly variable disease - **inter-individual**, over time **intra-individual**.
- **practically every asthmatic** has experienced an acute exacerbation at some point - **sometimes as the first manifestation** (paradoxically, the (as yet unrecognized) disease is alerted *in time*).

**Many Forms:**

- from **light**,
- to *severe* life-threatening condition:
  - a severe form forces the patient to seek **urgent medical care**, possibly

hospitalization, **systemic corticoids** are needed.

## Onset of exacerbation

- **gradual** (progresses over several hours/days) or
- **dramatically and sudden** (minutes), like some **near-fatal variants**.

Exacerbation is characterized by:

- **reduced expiratory flow** and **worsening of obstruction**,
  - **deterioration of lung function** can be measured - PEF or FEV1
    - more reliable indicator **st. airflow limitation** than the severity of symptoms,
    - **St. difficulties** = more sensitive measure of the onset of exacerbation (worsening of symptoms is preceded by a decrease in PEF),
    - a small number of patients perceive the symptoms poorly - they may have a **significant decrease in lung function without a significant change in symptoms** (especially patients with so-called fatal asthma, more likely in men).

## Causes of exacerbations

Acute exacerbations are usually:

- as a result of **exposure to triggers**, no. **viral infection/allergen**,
- with a more prolonged course of deterioration - they may be the result of *failure of long-term therapy*.

## Morbidity and Mortality

- nothing is associated with:
  - **inability to determine the severity** of exacerbations,
- **inadequate solution to its beginning**,
- **insufficient therapy**.

## Selection and initiation of exacerbation therapy

Exacerbation therapy depends on:

- the patient,
- the experience of a healthcare professional,
- the most effective therapeutic procedures for this patient,
- availability of drugs and acute care facilities.

Exacerbation is necessary:

1. recognize in time
2. correctly determine the weight,

3. start effective therapy in time,
4. monitor response to initial asthma attack treatment.

At the same time, continuously consider:

- who and where will conduct the treatment,
- whether we can manage the treatment in a home environment/ambulance,
- whether to hospitalize.

If there is a high risk of dying from asthma, we will ensure:

1. immediate professional care,
2. thorough monitoring.

This is what patients require:

- after a near fatal asthma attack,
- after an acute hospitalization last year for an acute asthma attack
- intubated for asthma,
- currently/recently using p.o. corticoids,
- excessively dependent on inhaled  $\beta$ 2-agonists with rapid onset of action ( $>1$  salbutamol inhaler/equivalent),
- with psychiatric on./psychosocial problems,
- denying asthma (/severity) or their family does,
- patients do not adhere to the long-term therapy plan for bronchial asthma.

**He can do it at home** (educated patient):

- **mild exacerbations** with good response to initial therapy...

**Seek medical help - immediately** - if there is a **severe seizure**:

- sick **breathless at rest**,
- **bent forward**,
- **doesn't speak in sentences**, only in words (infants stop eating),
- **restless, confused** or **languid**,
- with **bradycardia/respiratory rate  $> 30$  breaths/min**,
- **squeaks loud/disappeared**,
- **pulse  $> 120$ /min** (infants 160/min),
- **PEF** after initial treatment  **$< 60\%$**  of NH or ONH,
- the patient is **exhausted** in general.

**Seek medical help** if:

- **response to initial bronchodilator** treatment is *not quick and does not last for at least 3 hours*

or

- **no improvement within 2-6 hours after initiation of p.o. therapy corticoids**

or

- *further deterioration occurs.*

## Own treatment

Exacerbation of bronchial asthma - requires **immediate treatment**.

At all levels of care, the following are essential:

- **inhaled  $\beta$ 2-agonists with rapid onset of action** in **adequate doses**:
  - during the 1st hour: **2-4 doses every 20 minutes**.
  - after the 1st hour: **according to the severity of the exacerbation**.
    - **mild exacerbations** - response to administration of **2-4 doses every 3-4 hours**,
    - **moderately severe exacerbations** - response only at **6-10 doses after 1-2 hours**.
    - **severe exacerbations** - **up to 10 breaths** (*preferably through an inhalation attachment*) or **full doses from a nebulizer**, possibly in  **$< 1$  hour** intervals.
  - *Bronchodilation treatment* - with a standard aerosol dispenser (MDI), preferably via an inhalation attachment, improves lung function min. as the same dose administered by nebulizer.
  - No additional medication is needed if rapid-acting inhaled beta2-agonists result in a complete response where PEF returns to  $> 80\%$  NH or ONH) and improvement lasts at least 3-4 hours.
  - newly, it is better to administer salbutamol in an isotonic solution of  $MgSO_4$  than in FR.
  - combination of an inhaled/nebulized  $\beta$ 2-agonist with an anticholinergic (iprapropium bromide) may have a better bronchodilation than the individual drugs alone.
  - if we don't have inhalation drugs, p.o. bronchodilators can be administered.
- **Oral corticoids**

- in "moderately severe/severe exacerbation" (0.5-1mg/kg prednisolone (equivalent)/24 hours) give early to accelerate the improvement of all exacerbations, except for the mildest ones.
- by submission guide p.o. corticoids:
  - response to inhalation of  $\beta$ 2-agonists with rapid onset of action **not rapid/sustained after 1 hour** (e.g. PEF

not > 80% NH or ONH).

- if the oral dose is vomited shortly after administration - repeat its administration.
- i.v. administration - if desired i.v. access, or possibly impaired absorption from the GIT,
- i.m. suitable for those discharged from the acute medicine department, especially if he does not cooperate well with treatment.
- clinical improvement after the administration of systemic corticoids is expected in 4 hours at the earliest.
- **Theophyllines (= methylxanthines)**
  - not suitable as additional th. to high-dose inhaled  $\beta$ 2-agonists.
  - possible if inhaled  $\beta$ 2-agonists are not available.
  - if he uses theophyllines long-term, we should measure their serum concentration before administering short-acting theophyllines.
- giving oxygen:
  - indicated in medical facilities for hypoxia,
  - with nasal cannulas ("oxygen glasses"), a mask, small children can be in an oxygen tent,
  - SatO<sub>2</sub> of arterial blood was  $\geq 92\%$  (children 95%) - monitor carefully (pulse oximetry) especially children (measurement of pulmonary function usually difficult and saturation < 92% is a good indicator of the need for hospitalization - if it is not possible to measure saturations in children, always administer oxygen).
  - in jet nebulizers for nebulizing bronchodilator oxygen instead of air,
  - arterial blood gas examination - in patients with PEF values of 30-50% NH and those who have not improved after initial treatment.
  - keep breathing in oxygen even when taking a blood sample.
  - PaO<sub>2</sub> < 8 kPa (60 mm Hg) and normal/increased PaCO<sub>2</sub> (especially > 6 kPa - 45 mm Hg) for impending/developed respiratory insufficiency.
    - stabilization on the bed with the possibility of monitoring is recommended,
    - if transfer to ICU does not improve.

## Not suitable for asthma therapy

- Adrenaline **is not indicated for the treatment of an exacerbation** of asthma, **but for the management of anaphylaxis/angioedema.**
- **They are not suitable**
  - sedatives, mucolytics, ATB,
  - not even hydration with large volumes in adults/older children. (Small children/infants must be given enough fluids.)
- Respiratory RHB or physiotherapy is **unsuitable** for the treatment of acute exacerbation - it is **possible worsening of discomfort** of patients.

## Links

### Related Articles

On the VPL portal:

- Asthma bronchiale therapy
- Asthma bronchiale

On Wikilectures:

- Asthma
- Asthma bronchiale/case report
- Status asthmaticus
- Therapy of asthma bronchiale

Case report:

- Asthma bronchiale/case report

### External links

[www.svl.cz/....astma-2008.pdf](http://www.svl.cz/....astma-2008.pdf) ([https://www.svl.cz/Files/nastenka/page\\_4771/Version1/astma-2008.pdf](https://www.svl.cz/Files/nastenka/page_4771/Version1/astma-2008.pdf))

## References

- SALAJKA, František. *Bronchial asthma : Recommended diagnostic and treatment procedure for general practitioners* [online] . 1. edition. Prague : Society of General Medicine ČLS JEP, 2008. Available from <<https://www.svl.cz/default.aspx/cz/spol/svl/default/menu/doporucenepostu/doporucenepostu5>>. ISBN 978-80-86998-26-8.
- SALAJKA, F – KONŠTACKÝ, S – KAŠÁK, V. *Bronchial asthma : Recommended diagnostic and treatment procedure for general practitioners*. 1. edition. Prague : Center for Recommended Practices for General Practitioners, 2005.
- SALAJKA, F – KAŠÁK, V – POHUNEK, P. *Diagnosis, treatment and prevention of bronchial asthma in the Czech Republic : Putting Global Strategy into Practice*. 1. edition. Prague : Jalna, 2008.