

Bronchial Asthma Attack Therapy / PGS (VPL)

Exacerbation of bronchial asthma attack

Exacerbation of asthma (= asthma attacks):

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

Variability

Asthma bronchiale:

- very variable disease - **interindividually**, in time **intraindividual**.
- **virtually every asthmatic** sometimes underwent acute exacerbation - **sometimes as the first manifestation** (paradoxically, it will warn us of the disease (not yet known) **in time**).

Many forms:

- from **light**,
- to a **severe** life threatening condition:
 - severe form forces the patient to seek **urgent medical care, ev. hospitalization is needed, systemic corticoids**.

Onset of exacerbation

- **gradual** (progresses within a few hours / days) or
- **dramatically abrupt** (minutes), like some **near-lethal variants**.

Exacerbation is characterized by:

- **reduction of expiratory flow** and **worsening of obstruction**,
 - is possible to **measure deterioration in lung function** - PEF or FEV1
 - more reliable indicator **st. air flow limitation**, than the severity of the symptoms,
 - **st. difficulties** = more sensitive rate of onset of exacerbation (worsening of symptoms precedes decrease of PEF),
 - a small proportion of patients perceive symptoms poorly - 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 - may be the result of **failure of long-term therapy**.

Morbidity and mortality

- most often associated with:
 - **inability to determine the severity** of the exacerbation,
- **inadequate solution to its beginning**,
- its **inadequate therapy**.

Selection and initiation of exacerbation therapy

Exacerbation therapy depends on:

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

Exacerbation is necessary to:

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

3. initiate effective therapy in a time,
4. monitor the response to initial treatment of an asthma attack.

At the same time, consider:

- who will lead the treatment and where,
- whether we can handle the treatment in the home environment / outpatient clinic,
- whether to hospitalize.

With a high risk of death from asthma, we provide:

1. immediate professional care,
2. thorough monitoring.

This is what patients require:

- after an almost fatal asthma attack,
- after an acute hospitalization in last year for an acute asthma attack,
- when they are intubated for asthma,
- if they are currently/recently using p.o. corticoids,
- if they are overdependent on inhaled β 2-agonists with rapid onset of action (> 1 salbutamol inhaler / equivalent),
- with psychiatric illness / psychosocial problems,
- if they are denying asthma (/severity of it) or their family does so,
- if they do not follow a long-term bronchial asthma treatment plan.

Educated patient **manages at home**:

- **light exacerbations** with a good response to initial therapy...

Seek medical help - immediately - if it is **severe seizure**:

- the sick patient is **suffocating at rest**,
- the patient is **bent forward**,
- the patient **does not speak in sentences**, only in words (infants stop eating),
- the patient is **restless, confused** or **lethargic**,
- with **bradycardia/respiratory rate > 30 breaths/min**,
- **whistles are loud / faded**,
- **pulse > 120 /min** (infants 160/min.),
- **PEF** after initial treatment is **$< 60\%$ NH or ONH**,
- patient is generally **exhausted**.

Seek medical attention necessary if:

- **response to initial bronchodilator therapy is not rapid and does not last for at least 3 hours.**

or

- **there is no improvement within 2-6 hours after starting p.o. corticosteroid therapy**

or

- **further deterioration** occurs.

Treatment

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

The following are essential at all levels of care:

- **inhaled β 2-agonists with rapid onset of action in sufficient doses**:
 - during the 1st hour : **2-4 doses every 20 minutes**.
 - after the 1st hour: **according to the severity of the exacerbation**.
 - **light exacerbation** - response when administering **2-4 doses every 3-4 hours**,
 - **moderate exacerbations** - response at up to **6-10 doses after 1-2 hours**,
 - **severe exacerbations** - **up to 10 breaths in** (*preferably via an inhalation attachment*) or **full doses from the nebulizer**, ev. at intervals **< 1 hour**.
 - **Bronchodilator treatment** - standard aerosol dispenser (MDI), preferably via an inhalation attachment, improves lung function min. as the same dose administered by the nebulizer.
 - No additional drugs are needed if fast-acting inhaled beta2-agonists lead to a complete response, with PEF returning to $> 80\%$ NH or ONH) and improvement lasting at least 3-4 hours.

- it is better to administer salbutamol in an isotonic solution MgSO_4 than in FR .
- the combination of an inhaled / nebulized β_2 -agonist with an anticholinergic (ipratropium bromide) may bronchodilate better than either drug alone.
- if we do not have inhaled drugs, bronchodilators can be given p.o.
- **Oral corticoids**
 - early in **moderate / severe exacerbations** (0.5-1 mg / kg prednisolone (or equivalent) / 24 hours) to accelerate the improvement of all exacerbations, only in case of the most light ones.
 - guideline for the administration of p.o. corticosteroids:
 - response to inhalation of fast-acting β_2 -agonists **not fast / permanent after 1 hour** (eg. PEF is not > 80% NH or ONH).
 - in case of vomiting of the oral dose shortly after administration - repeat its administration.
 - i.v. administration - if i.v. access is desired or absorption from the GIT is likely to be impaired ,
 - i.m. suitable for those released from the acute medicine department, especially if they do not cooperate well in treatment.
 - clinical improvement after administration of systemic corticoids is expected in 4 hours at the earliest.
- **Theophyllines (= methylxanthines)**
 - not suitable as an additional th. to high-dose inhaled β_2 -agonists.
 - possible if inhaled β_2 -agonists are not available.
 - if they use theophyllines for a long time, we should measure their serum concentration before administering theophyllines with short-term effect.
- oxygen supply:
 - indicated in hypoxia in medical facilities,
 - nasal cannulas ("oxygen glasses"), mask, small children can be in the oxygen tent,
 - SatO_2 of arterial blood was $\geq 92\%$ (children 95%) - carefully monitor (pulse oximetry) especially of children (measurement of lung function is usually difficult and saturation $<92\%$ is a good indicator of the need for hospitalization - if saturation cannot be measured in children, oxygen should always be given).
 - into jet nebulizers to nebulize oxygen bronchodilators instead of air,
 - examination of blood gases from arterial blood - in patients with PEF values of 30-50% NH and those who did not improve after the initial treatment.
 - allow oxygen to be inhaled even when taking a blood sample.
 - $\text{PaO}_2 < 8 \text{ kPa}$ (60mm hg) and normal / elevated PaCO_2 (ex. $> 6 \text{ kPa}$ - 45mm Hg) or threatened / developed respiratory insufficiency.
 - bed stabilization with monitoring option is recommended,
 - if the condition of the patient does not improve, the patient is transferred to JIP.

Not suitable for asthma therapy

- Adrenaline **is not indicated for the treatment of asthma exacerbations, but for the management of anaphylaxis / angioedema.**
- **Not suitable are:**
 - sedatives, mucolytics, ATB,
 - nor high-volume hydration in adults / older children. (We must give fluids to young children / infants.)
- Respiratory RHB or physiotherapy **is unsuitable** for the treatment of acute exacerbations - is **possible worsening of discomfort** of patients.

Links

Related articles

On the VPL portal:

- Therapy of asthma bronchiale
- Asthma bronchiale

In Wikilectures:

- Asthma
- Asthma bronchiale/Case report
- Status asthmaticus
- Asthma bronchiale therapy

Case report:

- Asthma bronchiale/Case report

External links

www.svl.cz/....astma-2008.pdf (https://www.svl.cz/Files/nastenka/page_4771/Version1/astma-2008.pdf)

References

- SALAJKA, František. *Asthma bronchiale : Doporučený diagnostický a léčebný postup pro všeobecné praktické lékaře* [online] . 1. edition. Praha : Společnost všeobecného lékařství ČLS JEP, 2008. Available from <<https://www.svl.cz/default.aspx/cz/spol/svl/default/menu/doporucenepostu/doporucenepostu5>>. ISBN 978-80-86998-26-8.
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