

## **TREATMENT OF THE ASTHMATIC PATIENT UNDER AGE 5**

Some Guidelines form PRACTALL initiative and GINA about Asthma treatment in children less than 5 years old.

### **Patterns of recurrent wheeze in pediatric patients**

Three different patterns of recurrent wheeze in pediatric patients have been proposed (12), and a fourth was recently described (13). However, it should be noted that patterns 1 and 2 (listed below) can only be discriminated retrospectively and are not suitable for use when treating the child.

1. Transient wheezing: Children who wheeze during the first 2–3 years of life, but do not wheeze after the age of 3 years
2. Nonatopic wheezing: Mainly triggered by viral infection and tends to remit later in childhood
3. Persistent asthma: Wheezing associated with the following:
  - Clinical manifestations of atopy (eczema, allergic rhinitis and conjunctivitis, food allergy), blood eosinophilia, and/or elevated total immunoglobulin E (IgE)
  - Specific IgE-mediated sensitization to foods in infancy and early childhood, and subsequently to common inhaled allergens (14–18) • Inhalant allergen sensitization prior to 3 years of age, especially with sensitization and high levels of exposure to specific perennial allergens in the home (10)
  - A parental history of asthma (15)
4. Severe intermittent wheezing (13): Infrequent acute wheezing episodes associated with the following:
  - Minimal morbidity outside of time of respiratory tract illness
  - Atopic characteristics, including eczema, allergic sensitization and peripheral blood eosinophilia

### **Predictive Asthma Index**

3 or more bronchobstructive episodes

Mayor Criteria	Minor Criteria
Family history of asthma (mother)	Eosinophils > 4%
Physician Diagnosis of Eccema	Wheezing at different times to viral infections
Aeroallergen Sensitivity	Allergic rinitis
	Food sensitivity

## Asthma control levels (GINA)

### UNDER 5 YEARS OLD

Characteristic	Controlled	Partly controlled	Uncontrolled
Daytime symptoms	None or minimal	Two or more times a week	Three or more times a week
Symptoms or nighttime awakenings	None	Cough, wheezing, dispnea during sleep	
Rescue treatment	None or maximum two days a week	More than two days a week	
Limitation of activity	None	Cough, wheezing, dispnea during sleep	

#### **In all children, ask about:**

- Wheezing, cough
- Specific triggers: e.g. passive smoke, pets, humidity, mold and dampness, respiratory infections, cold air exposure, exercise/activity, cough after laughing/crying
- Altered sleep patterns: awakening, night cough, sleep apnea
- Exacerbations in the past year
- Nasal symptoms: running, itching, sneezing, blocking

#### **In infants (<2 years), ask about:**

- Noisy breathing, vomiting associated with cough
- Retractions (sucking in of the chest)
- Difficulty with feeding (grunting sounds, poor sucking)
- Changes in respiratory rate

#### **In children (>2 years), ask about:**

- Shortness of breath (day or night)
- Fatigue (decrease in playing compared to peer group, increased irritability)
- Complaints about \_not feeling well\_
- Poor school performance or school absence
- Reduced frequency or intensity of physical activity, e.g. in sports, gym classes
- Avoidance of other activities (e.g. sleepovers, visits to friends with pets)
- Specific triggers: sports, gym classes, exercise/activity
- Specific triggers: sports, gym classes, exercise/activity

### **Asthma treatment in children aged 0–2 years**

- Consider a diagnosis of asthma if >3 episodes of reversible bronchial obstruction have been documented within the previous 6 months
- Intermittent b2 agonists are first choice (inhaled, jet nebulizers in the US and oral in Europe) despite conflicting evidence
- LTRA daily controller therapy for viral wheezing (long- or short-term treatment)
- Nebulized or inhaled (metered-dose inhaler and spacer) corticosteroids as daily controller therapy for persistent asthma, especially if severe or requiring frequent oral corticosteroid therapy
- Evidence of atopy/allergy lowers the threshold for use of ICS and they may be used as first-line treatment in such cases
- Use oral corticosteroids (e.g. 1–2 mg/kg prednisone) for 3–5 days during acute and frequently recurrent obstructive episodes

### **Asthma treatment in children aged 3–5 years**

- ICS are the first choice, budesonide 100–200  $\mu$ g · 2 or fluticasone 50–125  $\mu$ g · 2 by MDI
- Short-acting b2 agonists, salbutamol 0.1 mg/dose or terbutaline 0.25 mg/dose 1–2 puffs at 4-h intervals as needed
- LTRA can be used as monotherapy instead of ICS if symptoms are intermittent or mild persistent
- If full control is not achieved with ICS, add LTRA montelukast 4 mg granules or 4 mg chewing tablet
- If control still not achieved consider the following (nonsequential) options:
  - Add LABA at least intermittently (although note lack of published evidence supporting use in this age group)
  - Increase ICS dose
  - Add theophylline

### **Stepwise treatment for acute asthma episodes.**

Begin at first step available depending on whether patient is treated at home, in GP's office or in hospital

- Inhaled short-acting b2 agonists (spacer): Two to four puffs (200  $\mu$ g salbutamol equivalent) every 10–20 min for up to 1 h. Children who have not improved should be referred to hospital
- Nebulized b2 agonists: 2.5–5 mg salbutamol equivalent can be repeated every 20–30 min
- Ipratropium bromide: This should be mixed with the nebulized b2 agonist solution at 250  $\mu$ g/ dose and given every 20–30 min
- High-flow O<sub>2</sub> (if available) to ensure normal oxygenation
- Oral/i.v. steroids: Oral and i.v. glucocorticosteroids are of similar efficacy. Steroid tablets are preferable

to inhaled steroids (a soluble preparation is also available for those unable to swallow tablets). A dose of 1–2 mg/kg prednisone or prednisolone should be given (higher doses may be used in hospital). Treatment for up to 3 days is usually sufficient

- Intravenous  $\beta_2$  agonists: The early addition of a bolus dose of i.v. salbutamol (15  $\mu\text{g}/\text{kg}$ ) can be an effective adjunct, followed by continuous infusion of 0.2  $\mu\text{g}/\text{kg}/\text{min}$
- High dependency unit: children should be transferred to a pediatric intensive care unit if there is a downhill trend and oxygenation cannot be maintained. Small children with limited ventilator reserves are at particular risk of respiratory failure\*

## **Immunotherapy**

Preventive effect. Specific immunotherapy can prevent sensitization to other allergen. It can also improve asthma, prevent progression from allergic rhinitis to asthma and reduce the development of asthma in children with seasonal allergies. The effect of immunotherapy appears to continue after treatment has stopped, resulting in prolonged clinical remission of allergic rhinitis symptoms.

Efficacy. Based on a meta-analysis of 75 studies, immunotherapy can be recommended for individuals with asthma who have proven sensitization to allergens. Efficacy of immunotherapy will depend on the quality of the extracts used.

Sublingual: Sublingual immunotherapy (SLIT) may be a safe and effective alternative to subcutaneous injections in children, although efficacy in young children under 5 years of age is less well documented. A systematic review concluded that SLIT has only low-to-moderate clinical efficacy in children with mild-to-moderate persistent asthma who are at least 4 years old and sensitized only to house-dust mites. The analysis failed to find evidence for use in seasonal allergic rhinitis, despite a prior recommendation for use in this indication from the ARIA Workshop Group. However, a recent meta-analysis shows that compared with placebo, SLIT with standardized extracts is effective in pediatric patients with allergic rhinitis.