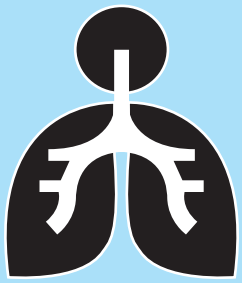
Vol. 10 No. 1 March-May' 14

Asthma Focus

Management of Childhood Asthma



International epidemiological studies on allergic diseases in children (the ISAAC-I and ISAAC-III) indicated that prevalence of childhood asthma is increasing worldwide, including among countries in Asia. Asthma typically begins in early childhood, with an earlier on set in males than females. Asthma is defined as a chronic inflammatory disorder of the airways and is associated with airway hyperresponsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness, and coughing. However, in children 5 years and younger, the clinical symptoms of asthma are variable and non-specific.

Risk Factors Associated with the Development of Asthma

Epidemiologic studies have identified a number of risk factors associated with the development of asthma, including (but not limited to) sensitization to aeroallergens, maternal diet during pregnancy and/or lactation, pollutants (particularly environmental tobacco smoke), microbes and their products, and psychosocial factors. However, evidence for avoidance measures to prevent asthma is lacking in many cases. Several types of aeroallergens are particularly important in relation to asthma. Companion pets and cockroaches can contribute to the risk of developing asthma in children if sensitized to the species and control mechanism is necessary thereafter but there is no evidence that dust mite measures can prevent the onset of asthma.

Maternal smoking during pregnancy and exposure to tobacco early in life are associated with a greater risk of developing wheezing illnesses in childhood, as well as with reduced lung function later in life. Wheezing in early childhood is predominately linked to viral infections, especially those due to rhinovirus, respiratory synctial virus (RSV), Boca virus, and metapneumovirus (MPV). A child's social environment may also play a role in the development and severity of asthma. Stress in family or other primary care givers during the first year of life is associated with an atopic profile and wheeze in infants and is also associated with asthma at age 6-8 years. Maternal distress in early life may play a role in the development of childhood asthma, especially if the distress continues beyond the postpartum period. Children born by Cesarean section have a higher risk of asthma than those born by vaginal delivery, particularly children of allergic parents. At present, there are insufficient data to support a protective effect of any dietary intervention during pregnancy or lactation in preventing asthma or a topic disease. Breastfeeding itself decreases early childhood wheezing syndromes associated with upper and lower respiratory infections. However, although recommended for its general health benefits, there is little evidence that breastfeeding prevents development of persistent asthma.

Diagnosis: Making a diagnosis of asthma in children 5 years and younger may be difficult because episodic respiratory symptoms such as wheezing and cough are also common in children who do not have asthma, particularly in those younger than 3 years. Furthermore, it is not possible to routinely assess both airflow limitation and inflammation in this age group. Nevertheless, a diagnosis of asthma in young children can often be made based largely on symptom patterns and on a careful clinical assessment of family history and physical findings. The presence of atopy or allergic sensitization provides additional predictive support, as early allergic sensitization increases the likelihood that a wheezing child will have asthma.

Symptoms: Symptoms in this age group that may indicate a diagnosis of asthma include wheeze, cough, breathlessness (typically manifested by patterns of activity limitation) and nocturnal symptoms/awakenings.

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Asthma Focus

Wheeze : It is the most common symptom associated with asthma in children 5 years and younger, has been strictly defined as a continuous high-pitched sound, sometimes with musical quality, emitting from the chest during expiration. Wheezing occurs in several different patterns but a wheeze that occurs recurrently, during sleep or with triggers such as activity, laughing or crying is consistent with a diagnosis of asthma. Viral respiratory infections are the most common factors responsible for acute wheezing episodes in young children and some viral infections (RSV and rhinovirus) are associated with recurrent wheeze throughout childhood. Since many young children may wheeze with viral infections, deciding when the presence of wheezing within fections is truly an initial or recurrent clinical presentation of childhood asthma is difficult.

Cough : Cough due to asthma is recurrent and/or persistent, and is usually accompanied by some wheezing episodes and breathing difficulties. Nocturnal cough (occurring when the child is asleep) or cough occurring with exercise, laughing or crying in the absence of an apparent respiratory infection, strongly supports a diagnosis of asthma. The common cold and other respiratory illnesses are also associated with cough.

Breathlessness : This term is often used by Parents by Difficult Breathing, Heavy Breathing, and Shortness of Breath. Breathlessness that occurs during exercise and is recurrent increases the likelihood of the presentation being due to asthma. In infants and toddlers, crying and laughing are an exercise equivalent.

Clinical History

For children 5 years and younger with a history of recurrent respiratory symptoms; a strong family history of asthma in first degree relatives (especially the mother); and/or atopy presenting as atopic dermatitis, food allergy and/or allergic rhinitis also make a diagnosis of asthma more likely.

Tests for Diagnosis : While no tests diagnose asthma with certainty in young children, the following may be considered as useful adjuncts in making a diagnostic decision.

Therapeutic Trial : A trial of treatment with short-acting bronchodilators and inhaled glucocorticosteroids for at least 8-12 weeks may provide some guidance as to the presence of asthma (Evidence D). These interventions should be evaluated in terms of how they affect control of daytime and nocturnal symptoms as well as the frequency of exacerbations requiring increasing doses of inhaled or systemic glucocorticosteroids. Marked clinical improvement during the treatment and deterioration when it is stopped supports a diagnosis of asthma. Due to the variable nature of asthma in young children, a therapeutic trial may need to be repeated more than once in order to be certain of the diagnosis.

Tests for Atopy : Sensitization to allergens can be assessed using either immediate hypersensitivity skin testing or an in vitro method that detects antigen-specific Ig E antibody. Skin prick testing is less reliable for confirming atopy in infants.

Chest Radiograph (X-Ray) : If there is doubt about the diagnosis of asthma in a wheezing child, a plain chest radiograph may help to exclude structural abnormalities of the airway (e.g., congenital malformations such as congenital lobar emphysema, vascular ring), chronic infection (e.g., tuberculosis) or other diagnoses.

Lung function testing, bronchial challenge and other physiological tests do not have a major role in the diagnosis of asthma in children 5 years and younger due to the inability of children this age to perform reproducible expiratory maneuvers. Such tests are only possible in specialized centers and are undertaken mainly for research purposes.

Differential Diagnosis

Although a variety of tools have been described above to aid the clinician in making a diagnosis of asthma in children 5 years and younger, it must be emphasized that a definite diagnosis in this young age group is challenging and has important clinical consequences. Thus, alternative causes that can lead to respiratory symptoms of wheeze, cough and breathlessness must be considered and excluded before an asthma diagnosis is arrived at (Table 1). Neonatal or very early onset of symptoms (associated with failure to thrive), symptoms associated with vomiting, or focal lung or cardiovascular signs, suggest an alternative diagnosis and indicate the need for further investigations.

TABLE 1- Differential Diagnosis of Asthma in Children 5 Years and Younger

Infections
- Recurrent respiratory tract infections
- Chronic rhino-sinusitis
- Tuberculosis

Congenital problems
- Tracheomalacia
- Cystic fibrosis
- Bronchopulmonary dysplasia
- Congenital malformation causing narrowing of the intrathoracicairways
- Primary ciliary dyskinesia syndrome
- Immune deficiency
- Congenital heart disease

Mechanical problems
- Foreign body aspiration
- Gastroesophageal reflux

Asthma Focus

Wheezing Phenotypes

Recurrent wheezing occurs in a large proportion of children 5 years and younger. However, not all of this wheezing indicates asthma. Several phenotypes of wheezing disorders in this age group have been recognized in epidemiologic studies. Early childhood wheezing has been classified by a Task Group convened by the European Respiratory Society (ERS)as either episodic wheeze (wheezing during discrete time periods, often in association with clinical evidence of a common cold, with absence of wheeze between episodes) or multiple-trigger wheeze (wheezing hat occurs as episodic exacerbations as above, but also with symptoms including cough and wheeze occurring between these episodes, during sleep or with triggers such as activity, laughing or crying).

Data from a U.S. cohort study led to the description of three wheezing phenotypes : Transient wheeze (symptoms begin and end before the age of 3 years), persistent wheeze (symptoms begin before the age of 3 years and continue beyond the age of 6 years) and late-onset wheeze (symptoms begin after the age of 3 years).

The clinical usefulness of the phenotypes described by the ERS Task Group or based on data from the U.S. cohort study remains a subject of active investigation. Children with asthma may have any of these phenotypes, but asthma occurs much more rarely in the episodic wheeze and transient wheeze phenotypes compared to the other phenotypes. A number of other publications provide additional insights into wheezing phenotypes and their relationship to children 5 years and younger with asthma.

To aid in the early identification, in the clinical setting, of children 5 years and younger who wheeze and are at high risk of developing persistent asthma symptoms, a number of risk profiles have been evaluated. One such predictive assessment, the Asthma Predictive Index (API), is recommended for children with four or more wheezing episodes in a year and is based on information obtained from the Tucson (USA) Respiratory Study. One study has shown that a child with a positive API has a4- to 10-fold greater chance of developing asthma between the ages of 6 and 13, while 95% of children with a negative API remained free of asthma. The applicability and validation of the API in other countries and clinical situations is awaited.

Management and pharmacologic treatment

For all patients with a confirmed diagnosis of asthma, the goal of treatment is to achieve control of the clinical manifestations of the disease and maintain this control for prolonged periods, with appropriate regard to the safety and cost of the treatment required to achieve this goal. Control of asthma can be achieved in a majority of children 5 years and younger with a pharmacologic intervention strategy developed in partnership between the family/caregiver and the healthcare practitioner. As in older children and adults, inhaled therapy constitutes the cornerstone of asthma treatment in children 5 years and younger.

Asthma Education : Asthma education should be provided to family members and caregivers of wheezy children 5 years and younger when wheeze is suspected to be caused by asthma. An educational package should contain a basic explanation about asthma and the factors that influence it, instruction about correct inhalation technique and the importance of adherence to the prescribed medication regime and a description of how to recognize when asthma control is deteriorating and the medications to administer when this occurs. Randomized controlled trials in older children and adults have demonstrated that the use of a written asthma management plan along with careful verbal explanation of the treatment regime can improve asthma control.

Randomized controlled trials in older children and adults have demonstrated that the use of a written asthma management plan along with careful verbal explanation of the treatment regime can improve asthma control. For children 5 years and younger who cannot reliably perform lung function measurements, asthma management plans based on the levels of respiratory symptoms have been shown to be just as effective as plans based on self-monitoring of lung function (Evidence B). Crucial to a successful asthma education program are a patient-doctor partnership featuring a high level of agreement between family or caregiver and healthcare practitioner regarding the goals of treatment for the child, as well as intensive follow-up (Evidence D).

Asthma Control : For all patients with a confirmed diagnosis of asthma, the goal of treatment is to achieve control of the clinical manifestations of the disease and maintain this control for prolonged periods, with appropriate regard to the safety and cost of the treatment required to achieve this goal. A combination of increased daytime cough, daytime wheeze and nighttime β_2-agonist use has been found to be a strong predictor of an exacerbation in children 5 years and younger (predicting around 70% of exacerbations, with a low false positive rate of 14%). In contrast, no individual symptom was predictive of an imminent asthma exacerbation. Although exacerbations may occur in children after months of apparent clinical control, the risk is greater in patients whose current control is poor. On the other hand, the "future risk" of harm caused by excessive doses of medications or inappropriate treatment such as the prolonged use of high doses of inhaled or systemic glucocorticosteroids, must also be avoided by ensuring that treatment is appropriate and reduced to the lowest level that maintains satisfactory current clinical control.

Defining satisfactory current clinical asthma control in children 5 years and younger is problematic, since healthcare providers are almost exclusively dependent on the reports of the child's family members and caregivers who might be unaware either of the presence of asthma symptoms or of the fact that they representing controlled asthma.

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Asthma Focus

Moreover, as with the diagnosis of asthma, lung function testing is not feasible as a means to monitor control in children of this age. No objective measures to assess clinical control have been validated for children younger than 4 years (one such measure has been developed for children aged 4-11). However, a working scheme based on current expert opinion presents characteristics of controlled, partly controlled, and uncontrolled asthma for children 5 years and younger based on (1)symptoms recognized by family members/caregivers and (2) the child's need for reliever/rescue treatment (Table 2; Evidence D).

Pharmacotherapy

Inhaled therapy constitutes the cornerstone of asthma treatment in children 5 years and younger. A pressurized metered-dose inhaler (MDI) with availed spacer (with or without a face mask, depending on the child's age) is the preferred delivery system (Evidence A). This recommendation is based on studies performed with β_2-agonists. Nebulizers, the only viable alternative delivery systems in children, should be reserved for the minority of children who cannot be taught effective use of a spacer device.

Table 2: Levels of Asthma Control in Children 5 Years and Younger *

Characteristic	Controlled (all of the following)	Partly controlled (any measure present in any week)	Uncontrolled (three or more of features of partly controlled asthma in any week)
Daytime symptoms: wheezing, cough, difficult breathing	None (less than twice/week, typically for short periods on the order of minutes and rapidly relieved by use of a rapid-acting bronchodilator)	More than twice/week (typically for short periods on the order of minutes and rapidly relieved by use of a rapid-acting bronchodilator)	More than twice/week (typically last minutes or hours or recur, but partially or fully relieved with rapid-acting bronchodilator)
Limitations of activities	None (child is fully active, plays and runs without limitation or symptoms)	Any (may cough, wheeze, or have difficulty breathing during exercise, vigorous play or laughing)	Any (may cough, wheeze, or have difficulty breathing during exercise, vigorous play or laughing)
Nocturnal symptoms/ awakening	None (including no nocturnal coughing during sleep)	Any (typically coughs during sleep or wakes with cough, wheezing, and/ or difficult breathing)	Any (typically coughs during sleep or wakes with cough, wheezing and/or difficult breathing
Need for reliever/ rescue treatment	≤2 days/week	≤2 days/week	≤2 days/week

Controller Medications

Inhaled glucocorticosteroids : As in older children, several placebo-controlled studies of inhaled glucocorticosteroids in children 5 years and younger with asthma have found statistically significant clinical effects on a variety of outcomes, including increased lung function and number of symptom-free days and reduced symptoms, need for additional medication, caregiver burden, systemic glucocorticosteroid use and exacerbations (Evidence A). However, the dose-response relationships have been less well studied. The clinical response may differ depending on the specific device used for delivery and the child's ability to use it correctly. With correct use of a spacer device, twice the recommended initial low dose of inhaled glucocorticosteroid results in near-maximum benefits as regular, long term treatment in the majority of patients.

Lung Disease: Up To 85% patient Miss Early COPD Diagnosis, Research Reveals

A retrospective, 20-year study led by researchers at Plymouth University Peninsula Schools of Medicine and Dentistry shows that in up to 85 per cent of patients with chronic obstructive pulmonary disease (COPD) the underlying disease was being overlooked in previous settings. Missed opportunities occur commonly in both primary and secondary care.

The results, published in medical journal The Lancet Respiratory Medicine involved almost 39,000 men and women in the UK with chronic obstructive pulmonary disorder (COPD) and found that in the five-year period before they were diagnosed, 85% of the patients made at least one visit to their GP or a secondary care clinic with lower respiratory tract symptoms.

Symptoms were missed in 58% of patients between six and 10 years before diagnosis, and 42% between 11 and 15 years before diagnosis. Over 20 years, the number of patients given chest X-rays up to two years before a diagnosis of COPD increased significantly. But only a third of these patients were also given spirometry or "puff" tests of lung function.

Co-author Dr Erika Sims, from Cambridge-based consultants Research in Real Life, said: "These findings confirm that patients with undiagnosed COPD often visit health-care settings many times before eventually receiving a diagnosis".

"Overall detection can be improved by spirometry testing of patients who have an increased risk of disease - those who smoke (current or past), are aged 40 years or older, with a history of multiple lower respiratory tract complaints and common COPD comorbidities (eg, diabetes, cardiovascular disease, gastroesophageal reflux disease)."

"This study highlights the need to take a more systematic approach to spirometry in patients with symptoms such as cough and breathlessness to ensure that an accurate and timely diagnosis of COPD is made. This is particularly important in smokers and people with a history of smoking."

Use of inhaled glucocorticosteroids for up to 2 years has not been documented to induce remission of asthma; symptoms almost always return when treatment is stopped (Evidence B).

Since asthma is essentially an inflammatory disease of the lungs, progressive loss of the lungs has long been proposed. A study on long-term use of budesonide (3 years) in a large number of asthmatic children, in which they reported that budesonide use was not only associated with lower rate of hospitalizations but also with a larger improvement of FEV_1. Remarkably, it was demonstrated that children who started ICS later in their course of disease (>5 years) attained lower lung growth than those used early (<2 years). After such observation, two large investigations were carried to verify such contention, i.e, the Childhood Asthma Management Program (CAMP in the USA) and the Inhaled Steroids as Regular Treatment in Early Asthma. It was apparent that the use of ICS is constantly associated with lower degree of exacerbations of asthma but results on lung growth were not conclusive (not consistent in preventing decline in lung function as a whole but may/may not prevent the decline in severe patients. Thus, ICS is truly a 'controller' rather than a 'preventer' for asthma, as was previously conceived. The available data in children 5 years and younger suggest that, as in older children, clinically effective doses of inhaled glucocorticosteroids are safe and the potential risks are well balanced by the clinical benefits. However, higher doses have been associated with detectable systemic effects on both growth and the hypothalamic-pituitary-adrenal (HPA) axis.

Leukotriene modifiers : Leukotriene modifiers reduce asthma symptoms in children ages 2-5 years with a history of intermittent asthma by reducing the number of protocol-defined exacerbations, but do not reduce the frequency of hospitalizations, use of prednisolone, duration of exacerbations, or days without asthma symptoms (Evidence A). Moreover, no effect on post bronchiolitic wheeze or cough is seen following hospitalization with RSV bronchiolitis. However, the role of leukotriene modifiers as add-on therapy in children 5 years and younger whose asthma is uncontrolled on inhaled glucocorticosteroidsh as not been specifically evaluated. No safety concerns have been demonstrated from the use of leukotriene modifiers in young children.

Theophylline : Although a few studies in children5 years and younger suggest clinical benefit from regular use of theophylline, the effects are small and mostly non significant. Since theophylline has a narrow therapeutic window, its use in acute asthma in children in the late 1980's was mainly or those who did not respond adequately to inhaled β_2 -agonists and particularly for those who required hospitalization. Some investigations conducted to determine the effect of IV theophylline in addition to inhaled β_2 -agonists showed varying clinical results. Recent Cochrane analysis, analyzing 7 randomized controlled trial comparing aminophylline and placebo in 380 children with acute asthma who required hospitalization. The results indicated that those receiving aminophylline had no difference in length of hospital stay, symptoms, frequency of nebulizations, mechanical ventilation rates comparing to those receiving placebo. Together with the introduction of newer methods, devices for effective use of continuous nebulization of β-agonist in asthma, the use of IV aminophylline in acute asthma in children came to an almost complete halt with its use only limited chronic asthma. The efficacy of theophylline is less than that of low-dose inhaled glucocorticosteroids, and side-effects are more common (Evidence D).

Long-acting inhaled β2-agonists : These are bronchodilators, but as long term therapy for asthma they are only prescribed in combination with an inhaled glucocorticosteroid and are therefore considered controller medications. The effect of long-acting inhaled β2-agonists or combination products has not been adequately studied in children 5 years and younger. For moterol and salmeterol have shown long-lasting bronchodilatory and broncho protective effects in this age group (Evidence D).

Cromolyn and Nedocromil sodium : A Cochrane Review concluded that there was no beneficial effect of cromolyn therapy in preschool children (Evidence A) and nedocromil has not been studied in preschool children. Therefore, cromones cannot be recommended in this age group.

Oral and systemic glucocorticosteroids : Because of the side-effects associated with prolonged use, oralglucocorticos-teroids in young children with asthma should be restricted to the treatment of acute severe exacerbations, whether viral-induced or otherwise (Evidence D).

Asthma Focus

Allergen immunotherapy : Specific allergen immunotherapy (SIT) has been one of the most debated aspects in the field of asthma treatment for several decades. Despite the presence of limitations and confounding factors, there were some evidences available to suggest that both subcutaneous (SCIT) and sublingual (SLIT) immunotherapy may be a viable treatment for asthma. There are more than 60 randomized control trials of SLIT and a few of them have been specifically designed for asthma. Most studies reported that SLIT can reduce asthma symptom scores and medication use. SLIT has been evaluated among Asian children who were sensitized to mites in at least 3 studies. Most of these studies showed satisfactory results. In trials from Taiwan, improvement in spirometry parameters was also observed. Nevertheless, in Meta analyses there were high degree heterogeneity among studies (dose, duration and outcome measures) thus limited some extent of the positive conclusion. In a post marketing surveillance study of SLIT among pediatric patients (96,000 SLIT doses of extract administered), local side effects were mild, i.e., throat irritation and oral itching. Only 3% of patients or 0.083 per 1,000 doses were associated with side effects. Seven systemic side effects, including abdominal pain, conjunctival itching and rhinitis were noted. Most of these reactions were mild and required no treatment. No life-threatening events occurred. Neither fatal reaction nor need for hospitalization was observed. Most of SLIT studies utilized continuous regimen with maintenance vaccine giving all year round. However, co-seasonal ultra-rush administration of SLIT to birch pollen has recently been reported to be efficacious and safe. SLIT appeared to be a well-tolerated and safe treatment for pediatric asthma.

Reliever

There is a general agreement that short-acting β_2 -agonists such as salbutamol and terbutaline are the first-line agents for the treatment of acute asthma due to its rapid bronchodilating action and therefore the preferred reliever treatment for asthma in children 5 years and younger. Since the late 1980s, uncontrolled studies in asthmatic children have demonstrated that β_2 -agonists (terbutaline) could be safely and effectively administered by continuous nebulization. In a study, 26 children with severe exacerbations of asthma unresponsive to systemic theophylline, methylprednisolone and intermittent β_2 -agonist inhalation, continuous nebulized terbutaline administered at doses of 1-12 mg/h, for a mean duration of 7-8 h (range 1-24 h) caused clinical scores to improve rapidly and all patients showed marked improvement in pH and PaCO2 during the first 2h. A prospective randomized study treated 17 children with impending respiratory failure due to status asthmaticus with either continuous or intermittently nebulized salbutamol (0.3 mg/kg/h or 0.3 mg/kg over 20 min every h). As judged by the clinical score and blood gas values, the children in the continuous nebulization group improved faster and spent less time in hospital than those receiving intermittent treatment. No side effects were seen. It was quite apparent that continuous nebulization of either terbutaline or salbutamol was effective among hospitalized children with severe asthma. Surprisingly, when continuous nebulization was compared with intermittent nebulization among 2-18 years old patients presented with severe asthma in the emergency department (ED) setting, no difference in hospitalization rate was observed. However, in this study, continuous therapy provided a significant time savings in the delivery of asthma therapy to patients in a busy ED.

Oral therapy is not recommended due to its slower onset of action and its tendency to produce more side-effects. There is no evidence that inhaled Ipratropium has an important role in the daily management of asthma in children 5 years and younger (Evidence A).

The general approach for treating patients with severe acute asthma is to use β_2-agonist bronchodilators and corticosteroids. For rapid bronchodilation among these severe patients, penetration of inhaled drug to the affected small conducting airways may be impeded. In these circumstances, IV rather than inhaled administration of bronchodilators may provide an earlier clinical response. A study found that IV terbutaline was well tolerated in asthmatic children for up to 305 continuous hours, at varying doses up to a maximum of 10 µg/kg/min without significant elevation of CPK-MB. Arrhythmia was rare and only two occasions of ST-depression was observed. In a randomized, double-blind, placebo-controlled trial of IV salbutamol (15 µg/kg as a single bolus over 10 min) vs. nebulized ipratropium bromide (250 µg), or IV salbutamol plus ipratropium bromide in an early management of severe acute asthma in children presenting to an emergency department, children who received IV salbutamol for severe acute asthma showed a more rapid recovery time, which resulted in earlier discharge from the hospital than those administered inhaled ipratropium bromide. There was no additional benefit obtained by combining ipratropium bromide and IV salbutamol administration. For a safety concern, a retrospective study of admission records of 77 children admitted with acute severe asthma who needed IV terbutaline showed that there was a significant increase in heart rate and a significant fall in diastolic blood pressure among this cohort. Four patients required inotropic support. None of the patients had cardiac arrhythmias. Potassium supplements were required in 10 patients due to hypokalaemia. All patients improved and none required initiation of artificial ventilation after commencing terbutaline.

For treatment in the Emergency Department (ED), guidelines in North America and Europe still recommend inhaled β_2 -agonist therapy for all cases of asthma presenting to emergency departments. IV and subcutaneous β_2 -agonists are described as second line therapy for use in patients unresponsive to inhaled bronchodilator and systemic corticosteroid therapy or if the inhaled route is not practical for such patients.

Asthma Focus

Travers and Jones recently published a systematic review of IV β_2 -agonist for acute severe asthma in the ED and concluded that there is no evidence to support the advantage of the use of IV β_2 -agonists over inhaled β_2 -agonists limiting its use (IV route) in the ED situation

Treatment Strategy

The goal of asthma treatment, to achieve and maintain control of the disease, can be reached in a majority of children 5 years and younger with a pharmacologic intervention strategy developed in partnership between the family/caregiver and the healthcare practitioner. Although validated tools for assessment of asthma control have not been developed for young children, it is recommended that both current impairment (day and night symptoms, activity level impairment and need for rescue medications) and future risk (likelihood of acute exacerbation in the future) be assessed and controlled.

Who Should Be Treated : Regular controller treatment is normally recommended for children 5 years and younger whose frequency and severity of asthma symptoms without treatment indicates that their asthma is not controlled.

Approach to management : A low-dose inhaled glucocorticosteroid is recommended as the preferred initial treatment to control asthma in children 5 years and younger (Evidence A). This initial treatment should be given for at least 3 months to establish its effectiveness in reaching control. Table 3 presents a management approach based on asthma control for children 5 years and younger.

When doubling the initial dose of inhaled glucocorticosteroids fails to achieve and maintain asthma control, the child's inhalation technique and compliance with the medication regimen should be carefully assessed and monitored, as these are common problems in this age group. Furthermore, control of environmental factors should be assessed and addressed appropriately and the asthma diagnosis reconsidered.

The best treatment for children whose asthma is not controlled on twice the initial dose of inhaled glucocorticosteroid has not been established. Options to consider are to further increase the dose of inhaled glucocorticosteroid (perhaps combined with more frequent dosing) or to add aleukotriene modifier, the ophylline or a low dose of oralglucocorticosteroid for a few weeks until the control of the child's asthma improves (Evidence D). The need for this additional treatment should be reevaluated at each visit and maintained for as short a period as possible. Furthermore, the treatment goal or level of control that is feasible for each child must be considered and discussed with the family/caregivers, since a compromise might be necessary-accepting a level of persisting symptoms to avoid excessive and harmful doses of oral and inhaled glucocorticosteroids or theophylline.

Duration and adjustments to treatment : Asthma symptoms remit in a substantial proportion of children 5 years and younger and marked seasonal variations are seen in chronic symptoms and the risk of exacerbations. For children with seasonal symptoms, if daily long-term control therapy is discontinued after the season a written action plan detailing specific signs of worsening asthma and therapeutic interventions that should be subsequently initiated, should be reviewed with the caregivers. It is recommended that the continued need for asthma treatment in children under age 5 should be regularly assessed (e.g., every 3-6 months; Evidence D). A follow up visit should be scheduled 3-6 weeks after discontinuation of therapy to ascertain whether there mission of symptoms persists and there is no need for reinstitution of therapy.

Approach to the child with intermittent wheezing episodes: Intermittent episodic wheezing of any severity may represent unrecognized uncontrolled asthma, an isolated viral-induced wheezing episode or an episode of seasonal or allergen-induced asthma. The initial treatment is identical in any case: a dose of rapid-acting inhaled β_2-agonist every 4-6 hr as needed for a day or more until symptoms disappear (Evidence A).

The best way to treat intermittent episodic wheezing that occurs in children where a diagnosis of asthma cannot be confirmed, or is unlikely, is controversial. The short term addition of a controller medication-inhaled glucocorticosteroid, leukotriene modifier or oral glucocorticosteroid-has demonstrated no effects on wheezing symptoms or progression to asthma. However, in one study treating wheezing episode with 1,500 mg of Fluticasone Propionate daily for 10 days reduced the need for oral glucocorticosteroids for the episode (18% in the untreated arm vs. 8% in the treated arm). Therefore, although these treatments are widely practiced, based on current evidence, their continued use cannot be recommended (Evidence D).

Conclusion: For all patients with a confirmed diagnosis of asthma, the goal of treatment is to achieve control of the clinical manifestations of the disease, and maintain this control for prolonged periods, with appropriate regard to the safety and cost of the treatment required to achieve this goal. Control of asthma can be achieved in a majority of children 5 years and younger with a pharmacologic intervention strategy developed in partnership between the family/caregiver and the healthcare practitioner. As in older children and adults, inhaled therapy constitutes the cornerstone of asthma treatment in children 5 years and younger.

Ref. : Pedersen, Soren Erik, Suzanne S. Hurd, Robert F. Lemanske, Allan Becker, Heather J. Zar, Peter D. Sly, Manuel Soto-Quiroz, Gary Wong and Eric D. Bateman. "Global Strategy For The Diagnosis And Management Of Asthma In Children 5 Years And Younger." Pediatric Pulmonology 46 (2010).

Vol. 10 No. 1 March-May' 14

Asthma Focus

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Editorial Note

Dear Doctor,

We are happy to present you the 1st issue of "Asthma Focus" Newsletter, 2014. In this issue we have concentrated on Management of Childhood Asthma. We hope you will enjoy reading the publication!

We appreciate your comments and queries.

Please participate in Quiz competition & win prizes.

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