

Review Article

Diagnosis and treatment of wheezing and asthma in young children

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Introduction

Many Children experience wheeze during early childhood however not all young children who wheeze subsequently develop asthma.¹ Recurrent wheezing affects 20-30% of infants and toddlers, yet resolves in at least 50% of these children by school age.² The majority of wheezy infants and toddlers don't have asthma but rather may wheeze for a variety of anatomic and patho physiologic reasons, including small airway caliber, trachiomalacia, bronchomalacia, post viral airway inflammation or alteration in the maturation of the immune system such as reduced IFN- γ Production.^{3,4}

Though children younger than 3 years with frequent wheeze (eg, > 3 episodes in past year that lasted > 1 day and affected sleep)⁵ are at increased risk of developing asthma if they have a positive asthma predicative index (API) based on either 1 major risk factor (atopic dermatitis or > 1 parent with asthma) or 2 or 3 minor risk factors (allergic rhinitis, eosinophilia > 4% or wheezing without a cold).^{6,7}

In addition lung function testing in infants and toddlers can be used for documenting air way obstruction and reversibility.⁷ However lung function test in young children requires a specialized PFT laboratory having high quality spirometer with appropriate software and well trained personnel.⁸ Infant and toddlers may need to be sedated for this procedure but the developing country like Bangladesh do not have this kind of laboratory facilities.

As establishing a diagnosis of asthma in young children is challenging, so this review address the clinical experience-based recommendations for the diagnosis and management of wheeze and asthma in young children.

Treatment of wheezing episodes

Young children with episodic viral wheeze may or may not have true asthma and wheezing phenotypes described in literature in various categories like transient early wheezer, late onset non atopic wheezer and persistent gE- associated

wheezer.^{9,10} Choosing to treat a child with episodic viral wheeze should be individualized based on frequency of wheezing episodes and the children allergic status based on API which helps to identify those children who are likely to have true asthma.^{11,12} Young children with viral-associated episodic wheeze typically receive acute treatment with short acting B₂ adrenergic agonists (SABAs), oral corticosteroids or both, based on the severity of the episode. This clinical approach is appropriate for children who require oral steroid fewer than 3 times per year and don't have severe episodes or residual symptoms.⁵

Multiple studies have assessed the efficacy of intermittent or continuous inhaled cortico steroid (ICS), therapy in young children with recurrent wheeze and it has been shown that ICS therapy decreases exacerbation and increases episode free days but it has no effect on the natural history of asthma or wheeze later in childhood. So, this lack of efficacy in preventing progression, suggests that biological mechanisms affecting changes in asthma progression is refractory to prophylactic ICS therapy.¹³⁻¹⁶ So ICS therapy should not be prolonged in an effort to change the natural history of the disease.⁵

Treatment with long term controller therapy

Controller therapy is typically initiated in young wheezing children who meet at least one of the defined criteria.

In our country, National Asthma Guideline recommends stepwise approach for treating asthma in children below five years based on asthma persistence and Severity determined by scoring criteria.^{5,17} Children with intermittent symptoms of asthma, use of an as needed short acting β agonist alone is recommended⁵ but in young children with established persistent asthma should be treated with daily, long-term, ICS based controller therapy. The ICS have known therapeutic effects in improving lung function, asthma symptoms reducing airway hyperresponsiveness and reducing short aching B agonist and oral corticosteroid use.^{15,18,19}

Studies suggested that children respond more favorably to ICS therapy in comparison to LTRA (lukotriene receptor antagonist) but LTRA can be added as add on therapy with inhaled corticosteroid who fail to achieve control with single agent controller therapy.⁵ The goal of asthma therapy is to

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maintain long term control with least medication. So, asthma patient has to be on proper follow-up at 3 months interval and discontinuation of therapy is not to be considered until patient has demonstrated consistent asthma control for at least 6 months. Periodic assessment has to be needed to ensure that child is doing well and is not having subtle asthma symptoms. In the older age group spirometry or exhaled nitric oxide testing can be done for confirming that the child's asthma is not worsening.^{5,15,16,20,21}

Table-I: Criteria for initiating controller therapy in young children 4 years and younger who wheeze.

Recommended	
In young children with >4 episodes of wheezing in the past year lasting > 1 d and affecting sleep and who have risk factors for developing persistent asthma characterized by at least 1 of the criteria give in column A or by more than 1 criteria given Column B.	
Column A	Column B
Parental history of asthma Physician- diagnosed atopic dermatitis, Evidence of sensitization to aeroallergens	Evidence of sensitization to foods.>4 % Peripheral blood eosinophiliapresent. Wheezing apart fromcolds
Should be considered	
In young children with symptomatic treatment >2 times/wk for >4 wk. In young children with 2 asthma exacerbations requiring systemic corticosteroids within 6 months	
May be considered	
In young children during periods or seasons of previous documented risk.	

Conclusion

Establishing a diagnosis of asthma in young children is challenging and requires comprehensive assessment. It is therefore important for physicians to rule out other diseases before making a diagnosis and administering treatment for asthma. A positive response to short term (ie 4-6 weeks), trial-based controller therapy in young children can aid in diagnosis. ICS is the preferred controller therapy and it should be administered regularly and maintained with lowest dose till control. Therapy can be discontinued when asthma is in control for at least 6 months.

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