

The challenge of treating preschool asthma

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Children with preschool asthma characterized by repeated episodic lower airway symptoms with viral respiratory tract infections have had the highest rate of hospitalization for asthma of any age group.¹ The June issue of the *Journal* contains a *post hoc* study concluding that oral corticosteroids do not reduce the severity of acute lower respiratory tract illness in preschool children with recurrent wheezing.² The nihilistic conclusion of that report was reiterated in an accompanying editorial.³ Similar negative conclusions have been presented in 2 studies by Grigg and colleagues.^{4,5} However, it is time to bring some critical thinking, common sense, and the results of clinical experience to the issue of treating preschoolers with this asthma phenotype.

Doses were relatively low in the studies showing no effect from oral corticosteroids. Moreover, the progression of symptoms in the placebo group was associated with self-limited symptoms rapidly improving spontaneously within a few days on placebo in the recent publication² and within 12 hours in others.^{4,5} This bears little resemblance to patients referred to specialists. Preschool children with recurrent episodic lower respiratory tract symptoms who I see at a tertiary care referral center have generally had recurrent symptomatic periods either lasting for weeks after a viral respiratory tract infection or have progressed rapidly to require urgent care or hospitalization. Multiple physician and emergency department visits and frequent hospitalization often result. In fact, as many as 1 in 200 US children in the preschool age group have been hospitalized with a diagnosis of asthma (ie, viral respiratory tract infection-induced lower airway disease).¹ Moreover, asthma has been the leading cause of hospitalization at most children's hospitals in the United States.⁶

From 2 national databases, more than 5% of pediatric hospitalizations are for asthma and another 5% are for pneumonia,⁷ which, based on our clinical experience, includes a substantial number of young children with asthma misdiagnosed as pneumonia. In contrast, asthma is an uncommon pediatric admission at the University of Iowa Children's Hospital. I attribute this to our practice of treating nonatopic preschool children with this asthma phenotype by teaching the parents of children who have experienced episodes of viral respiratory tract infection-induced wheezing and cough that do not rapidly resolve with occasional albuterol to start an oral corticosteroid the day before dyspnea and wheezing are prominent. This has been shown to be recognizable in these children based on progressive severity of coughing.⁸

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Of course, this requires careful patient instruction, both oral and written. The response and frequency are carefully monitored, and the prescriptions parents are provided to have at home are not refilled without telephone or e-mail contact. Maintenance therapy with either montelukast or inhaled corticosteroids is not used in these children based on the various controlled clinical trials demonstrating lack of efficacy for these agents in preventing viral respiratory tract infection-induced lower airway obstruction.⁹⁻¹²

Another issue that needs to be addressed is the dose of oral corticosteroid to be used. The studies that I have referenced^{2,4,5} all used relatively low once-daily doses. In contrast, initial doses used for controlled clinical trials demonstrating clinical efficacy in the hospital or emergency department used higher doses. In fact, the one study that included specifically preschool children compared 4 mg/kg methylprednisolone with placebo. The corticosteroid in that study dramatically benefitted the actively treated children compared with those who received placebo.¹³ A recent study of children with a mean age of 4 years in an emergency department for asthma benefitted from early compared with somewhat delayed administration of systemic corticosteroids.¹⁴

We do not have data indicating the optimal dose of systemic corticosteroids for acute asthma in children. However, traditional doses of systemic corticosteroids based on body weight compared with dosages based on body surface area appear to result in underdosing of younger children with nephrotic syndrome.^{15,16} Although dose-response data for young children are lacking, such data have been demonstrated for adults, in whom higher doses provided earlier and greater increases in FEV₁ than lower doses over a range of 15 to 120 mg every 6 hours.¹⁷

While acknowledging that definitive double-blind, placebo-controlled trials of adequate doses of systemic corticosteroids in appropriately selected preschool children with sufficient morbidity are lacking, the nihilistic approach of the current publication² is nonetheless not justified. Because we accept oral corticosteroids as relevant for exacerbations of asthma in older children (most of which are induced by viral respiratory tract infections), it is not credible that responsiveness to oral corticosteroids begins *de nouveau* at age 5 or 6 years. However, let us change the calculation of oral corticosteroid dosage from the traditional 1 to 2 mg/kg/d (often divided) to 30 mg/m² of body surface area administered (not divided) twice daily. Given early in the course of an exacerbation, adequate doses of oral corticosteroids are likely to decrease the high prevalence of urgent care and hospitalization in the preschool child with recurrent viral respiratory tract infection-induced asthma.

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