Optimising the management of wheeze in preschool children

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Optimising the management of wheeze in preschool children

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How should young children be assessed?

One third of all preschool children will have an episode of wheeze and many of these present to primary care. Most will fall within a spectrum of diagnosis ranging from episodic viral wheeze to multiple trigger wheeze or early onset asthma. A small proportion will have other rare, but important, diagnoses such as foreign body aspiration, anaphylaxis, gastro-oesophageal reflux, congenital anatomical abnormalities or other chronic lung diseases. We have described a structured approach to diagnosis and management of bronchiolitis in a previous article in this journal last year so will not discuss this here.

What are the evidence-based treatment options?

In this article we suggest a practical approach to assessment of children aged two to five years with wheeze presenting to primary care. We describe typical and atypical features to allow differentiation between common and rare conditions and discuss some of the current controversy surrounding management. Finally, we suggest an evidence-based treatment approach with reference to current international guidelines.

Which children should be referred?

Clinical Assessment

European Respiratory Society (ERS) Task Force guidelines suggest that clinical assessment should try to classify children into either episodic viral wheeze or multiple trigger wheeze phenotypes. Episodic viral wheeze is characterised by discrete episodes of wheezing often associated with viral symptoms. There are no interval symptoms. In multiple trigger wheeze, wheeze is caused by several triggers including viral infection, exercise, smoke exposure and other allergens.

In clinical practice children rarely fit neatly into either category and it is
important to remember that the phenotype may change over time. The BTS/SIGN asthma guideline describes the clinical features which are suggestive of other diagnoses, see table 1, below.

Clinical examination may well be normal in a child presenting with chronic symptoms but it is essential to measure growth parameters and look for the features outlined in table 1, below.

During an acute presentation it is important to note:
- Respiratory rate
- Use of accessory muscles
- Presence of grunting
- Level of consciousness
- Temperature
- Chest auscultation should confirm wheeze and define whether this is widespread or focal. The presence of crepitations and whether these are focal or generalised should also be noted.

‘Children with wheeze and intermediate-risk features who fail to respond to bronchodilators should be referred immediately’

REFERRAL CRITERIA
Most children with wheeze can be managed safely in primary care. The child should be referred to hospital immediately if you suspect an inhaled foreign body or anaphylaxis (after administering IM adrenaline). NICE stratifies children with cough and chest signs into high- and intermediate-risk categories as outlined in table 2, below. Children presenting with wheeze and high-risk features or those who have intermediate-risk features but fail to respond to bronchodilator therapy should be referred immediately. Urgent outpatient review should be considered for symptoms present from early infancy, chronic wet cough, failure

| Table 1 |
|---|---|
| Table 1 | Clinical features suggestive of diagnoses other than asthma in children presenting with wheeze, adapted from BTS/SIGN 4 |

### Perinatal and family history
- **Symptoms present from birth or perinatal lung problem**
  - Cystic fibrosis
  - Chronic lung disease of prematurity
  - Ciliary dyskinesia
  - Developmental lung anomaly

### Family history of unusual chest disease
- Cystic fibrosis
- Neuromuscular disorder

### Severe upper respiratory tract disease
- Defect of host defence
- Ciliary dyskinesia

### Symptoms and signs
#### Persistent moist cough
- Cystic fibrosis
- Bronchiectasis
- Protracted bacterial bronchitis
- Recurrent aspiration
- Host defence disorder
- Ciliary dyskinesia

#### Excessive vomiting
- Gastro-oesophageal reflux ± aspiration

#### Dysphagia
- Swallowing problems ± aspiration

#### Breathlessness with lightheadedness and peripheral tingling
- Hyperventilation/panic attacks

#### Inspiratory stridor
- Tracheal or laryngeal disorder

#### Abnormal voice or cry
- Laryngeal problem

#### Focal signs in chest
- Developmental anomaly
- Post-infective syndrome
- Bronchiectasis
- Tuberculosis

#### Finger clubbing
- Cystic fibrosis
- Bronchiectasis

#### Failure to thrive
- Cystic fibrosis
- Host defence disorder
- Gastro-oesophageal reflux
to thrive or systemic involvement. Routine outpatient review should be considered if diagnosis remains in doubt or there is failure to respond to the therapies discussed below.

‘Children fit enough to be managed at home should not be prescribed a course of oral steroids’

MANAGEMENT OF WHEEZE

Acute wheeze
Those with high-risk features on assessment should be treated immediately with inhaled bronchodilator therapy. Those with intermediate risk should be treated immediately with bronchodilator therapy and reassessed 15-30 minutes later. Intermediate-risk children who respond, and low-risk children, can be managed at home with bronchodilator therapy via a spacer.

Parents should be advised that reassessment will be needed if they struggle to cope or if deterioration is evident.5

The ERS Task Force recommends that children fit enough to be managed at home should not be prescribed a course of oral corticosteroid therapy.6,7 Oral corticosteroids may continue to be used in children admitted to hospital with severe wheeze but even in this group the evidence base is controversial.8

Recurrent wheeze
There is no evidence to support the use of regular inhaled corticosteroids or leukotriene receptor antagonists in children with mild episodic viral wheeze.5,7 These children can safely be managed with intermittent bronchodilator therapy alone. In children whose episodic viral wheeze is frequent or requires admission to hospital then a trial of inhaled corticosteroids should be considered as described below.11

Although some guidelines suggest leukotriene receptor antagonists can be considered,3 a recent Cochrane review suggests no benefit in children with episodic viral wheeze.7

In children with multiple trigger wheeze whose symptoms are frequent (breathlessness on most days) consideration should be given to preventer therapy with either inhaled corticosteroids or leukotriene receptor antagonists. Bush and colleagues describe a pragmatic approach which involves introducing preventer therapy (either inhaled corticosteroids or leukotriene receptor antagonists at standard dose for 4-8 weeks).6 Following the trial period the treatment should be tapered and stopped and only reintroduced if symptoms recur. This allows the clinician to distinguish between those responding to treatment and those simply recovering.

‘If symptom control remains poor on initial preventer therapy review compliance and inhaler technique’

If symptom control remains poor on initial preventer therapy it is important to review compliance and inhaler technique and assess again for atypical features. If no cause for poor response can be found then it would be reasonable to trial combined inhaled corticosteroid and leukotriene receptor antagonist

Table 2

<table>
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<th>NICE risk classification in children presenting with chest signs</th>
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<td><strong>High risk</strong></td>
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<td><strong>Respiratory rate (RR)</strong></td>
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<td><strong>Other respiratory features</strong></td>
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<td><strong>Activity</strong>†</td>
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† Activity and appearance are highly subjective and considered poor markers of severity by some experts
 There is no evidence to support the use of regular inhaled corticosteroids (ICS) or leukotriene receptor antagonists (LTRA) in children with mild episodic viral wheeze. These children can safely be managed with intermittent bronchodilator therapy alone. In children whose episodic viral wheeze is frequent or requiring admission to hospital then a trial of ICS should be considered. In children with multiple trigger wheeze whose symptoms are frequent (breathlessness on most days) consideration should be given to preventer therapy with either ICS or LTRA.