The management of childhood asthma – what is new?

Steve Turner

Abstract

Childhood asthma is a common condition where there is no consensus on definition, no diagnostic test and no reliable test to monitor symptoms. Despite (or because of) these considerable clinical challenges, many national bodies produce guidelines for the diagnosis and management of childhood asthma. The British Thoracic Society and Scottish Intercollegiate Guidelines Network (BTS/SIGN) published their first asthma guideline in 1995 and have updated regularly, and most recently in 2016. The present article will (i) summarise changes in the BTS/SIGN asthma guideline between 1995 and 2014 and (ii) highlight what has changed between 2014 and 2016. The guideline has evolved considerably over 21 years, but the core principles for diagnosis and management have remained constant. The major changes to the 2016 guideline include (i) the initial trial of treatment should be with inhaled corticosteroids (ICS) (ii) there is new terminology for the dose of ICS (iii) there are new recommendations for the traditional "steps" 1 to 3 and (iv) the 5–12 and less than 5 year old stepwise algorithms in the 2014 guideline are now unified. For acute severe asthma, the first choice intravenous treatment is magnesium sulphate. Childhood asthma remains a clinical diagnosis where management is symptom-based and patient-focussed.

Keywords asthma; child; evidence-based medicine; guideline; pulmonary function testing; treatment

Background – a historical backdrop

The first UK guideline for childhood asthma diagnosis and management was produced in 1989, and this was timely since childhood asthma prevalence in the UK and Western world was rising rapidly at that time. There were two major reasons for the rise in asthma prevalence in the 1980s, firstly there was a genuine increase in the proportion of children with asthma and secondly there was a shift in the threshold for diagnosing asthma. The realisation that asthma did occur in children and responded to asthma treatment lead to a change in clinical thinking from "you can't diagnose asthma in a child under X years" (where X was somewhere between 5 and 10 years) to "if it is chronic and respiratory and paediatric it is asthma". The 1989 guideline provided clinicians a framework for diagnosing and also treating the "new" condition of childhood asthma. In 1990 the British Thoracic Society (BTS) published their first guideline on asthma management for adults.

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Adult and paediatric physicians worked with Scottish Intercollegiate Guidelines Network (SIGN) and published the first BTS/SIGN guideline on the management of asthma in 1995 (eventually published in 1998). The ground-breaking 1995 guideline, with its evidence-based approach and step-wise management, has become a core part of medical education in the UK and many other countries. The guideline was updated by changing existing text or by the addition of new chapters in 2003, 2008, 2009, 2012, 2014 and 2016. Table 1 summarises how the guideline has changed over time. Figure 1 demonstrates that the guideline has reached a steady state for page number since 2012. A more compact "quick reference" guideline has accompanied the 2014 and 2016 publications. The guidelines published in 2009 and 2012 were strictly updates of the 2008 guideline, and were produced in order to keep up with the evidence base.

The BTS/SIGN guideline is not the only international consensus document but its recommendations are very similar to those published in the USA (The Global Initiative for Asthma, first published in 1995), Australia (The Australian Asthma Handbook, first published in 1990) and Europe (The PRACTALL consensus report, first published in 2008).

Keeping abreast of changes in guidelines

Looking at Table 1, there are a number of recommendations which have persisted, e.g. asthma is a clinical diagnosis, objective tests have little/no role in diagnosis, management is patient-centred and based on regular review with a step up/step down approach. The prevalence of childhood asthma and the number of children admitted to hospital have fallen in the UK since the late 1990s, and this may be in part due to the introduction of the guideline leading to more accurate diagnosis and improved management. However it is important to note that changes in the guideline, e.g. the introduction of new treatments such as long acting beta agonists (LABA) and leukotriene receptor antagonists (LTRA), do not lead to abrupt changes in practice; clinicians had anticipated the introduction of LABA and LTRA and prescribed these medications in children for several years before they appeared in the guideline. There is an inevitable lag between changes in the guideline and practice, and Table 1 also identifies a number of practices which are no longer recommended but nonetheless persist, e.g. removing carpets, doubling inhaled corticosteroid (ICS) dose during exacerbation. Therefore whilst the guideline is appreciated by clinicians (it receives considerably more "hits" than any other SIGN guideline), "real-world" practice often differs, perhaps reflecting the challenge in keeping up with changes. This review will now summarise changes in the 2016 guideline relevant to children, and not discuss changes which only affect adults.

So what is new in 2016?

Asthma diagnosis

When comparing the "key recommendations" in the 2014 and 2016 guidelines, the greatest number of changes involve diagnosis. However, there has been no watershed moment here, and the diagnosis of asthma is still based on the history of recurrent cough and wheeze associated with shortness of breath and careful consideration of alternative diagnoses. The guideline previously had separate diagnostic algorithms for adults and children

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A summary of some of the child relevant changes to each revision of the BTS/SIGN asthma guideline

	Additions (and one deletion*)	Statements strengthened or weakened	Constant throughout
1995	• Asthma control first mentioned • Stepwise management for children aged less than 5 years. Older children treated as adults • Child defined as aged up to 15 years (for acute management only)	• "Patients should double their dose of ICS temporarily if their asthma deteriorates or at the first sign of an upper respiratory tract infection (1995)" "doubling the dose at the time of an exacerbation is of unproven value (2008)"	• The diagnosis is based on a history • There is no reliable objective test • Lack of therapeutic response may indicate an alternative diagnosis • Antibiotics and antihistamines are not indicated • A self-management plan/action plan should be agreed with the patient • Children should not be exposed to cigarette smoke • Ask about compliance/adherence
2003	• Concept of intermediate probability of an asthma diagnosis. • Long acting beta agonists and leukotriene receptor antagonists included as treatment options. • *Sodium cromoglycate no longer recommended (previously the first choice preventer). • For stepwise management, child defined as aged less than 12 years. Separate algorithms for under 5s and 5 to less than 12 year olds • For acute management, separate guidelines for less than 2, 2—5 and more than 5 years old • Consider stepping down after three months • List of alternative diagnoses provided	• Pulsus paradoxus from "not useful" in 1993 to "need not be measured" from 1995 to "abandoned as an indicator of severity" by 2003 • Peak flow to be more than 50% predicted prior to discharge after admission in 1995, more than 75% in 2003 and in 2016 "no single physiological parameter defines absolutely the timing of discharge" • For day-to-day management, "nebulisers are overused" (1993) "nebulisers are rarely needed" (1995) nebulisers not mentioned in the context of "stable asthma" by 2003 • For house dust mite measures "committed families" could remove carpets, remove soft toys form bed, dehumidify, etc (2003) becomes "Physical and chemical methods of reducing house dust mite levels in the home are ineffective and should not be recommended (2014, Level A evidence) • For air ionisers "anecdotal evidence that some patients have benefited" (1993), "Cannot be encouraged " (2003) and "air ionisers are not recommended (2008, level A evidence)	
2008	• "Watchful waiting" for the child with mild and non-specific symptoms recommended • Intravenous magnesium sulphate for acute severe asthma introduced • Consider chest X ray for severe acute asthma • New section on difficult asthma • New chapter on non- pharmacologic management. • Computer repeat-prescribing systems provide a practical index of adherence		
2009	• Influenza vaccine administered "independent of any consideration related to asthma" • Combine ipratropium bromide and salbutamol ("Combineb") three times in an hour for acute severe asthma • "Leukotriene receptor antagonist (LTRA) may be used for mild asthma exacerbations (2009)".		
2012	• New section on adolescent asthma (first mention of transitional care) • Anti IgE monoclonal antibody recommended under certain circumstances		
2014	• "Asthma attack" used instead of "asthma exacerbation"		
2016	• Trial of ICS for diagnosis • First treatment step is very low dose ICS • For severe asthma, the first choice intravenous treatment is magnesium sulphate		

Table 1

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