EDITORIAL

Preschool asthma - not so easy to diagnose

In this issue of the *Primary Care Respiratory Journal*, Andrew Bush¹ discusses the problems associated with diagnosing asthma in children under five in a primary care setting. This is an important and difficult topic where good, validated data are still sparse. As with other diseases, and also with asthma in older children, the diagnosis is based on symptoms (history-taking), physical findings (examination), and objective measurements. Although this sounds pretty straightforward, it is obvious from Bush's review paper that this is not the case.

Only a small proportion of children in this age group (under five years of age) can cooperate reliably with objective lung function measurements in order to document one of the important features of asthma – variable airflow obstruction. Although an individual child may be able to produce an occasional, reliable peak expiratory flow rate, the majority will not be able to do so with sufficient reproducibility over time to ensure that measured variability is caused by variable airflow obstruction, rather than lack of consistency due to variation in motivation or technique. Therefore, the presently available objective measures are unlikely to be helpful in the majority of children under five in a primary care setting, and consequently the diagnosis has to be based on symptoms and examination findings. However, in the vast majority there will be no specific physical findings consistent with asthma. A thorough physical examination mainly serves to exclude other rarer – and often more serious – conditions which may share some symptoms with asthma. These conditions and their most frequent physical findings are thoroughly summarised in the paper by Bush.

With these rather discouraging facts in mind, given that a correct diagnosis of asthma in children under five is heavily dependent on symptom presentation and history-taking, the question is: how reliable are these diagnostic tools in children under five? Several studies in older children with asthma have found that asthma severity and the impact of the disease upon the daily life of the child are often under-estimated – mainly because it is difficult to assess symptoms correctly and to assess the extent to which the child has adapted her or his lifestyle to avoid symptoms.²⁻⁹ As a result many children with asthma are not diagnosed or are under-treated. Most parents still believe that as long as the child is not suffering from wheeze there is no problem. However, it is often forgotten that the presence or absence of wheeze is a crude indicator of whether a child has clinically important airway obstruction since audible wheeze is not present in school age children unless FEV₁ is reduced by at least 30-40% (personal observation based on more than 400 bronchial challenges in our own clinic). Therefore, it is not surprising that studies (for example,¹⁰) have demonstrated that the clinical condition of children whose asthma symptoms seem trivial may still improve markedly when the child is treated with inhaled steroids.

When considering these findings one may ask what the hope is for accurate history and symptom assessment in children under five in whom virtually all information about the child's condition has to be obtained from the parents? Parental over-anxiety and over-interpretation of normal symptoms is not uncommon in young children. Parents may be unaware of important details because the child is in day care during periods of peak activity and many

children have had their symptoms for most of their life; consequently, the patients have adjusted their lifestyle to the asthmatic condition and the parents have come to accept this as “normal”. It is obvious from Bush’s review¹ that many of the symptoms supporting an asthma diagnosis in young children are not ‘asthma specific’. Some – such as cough – may be seen in healthy children (an average healthy child in these age groups has around six upper airway viral infections per year) and some – such as cough, wheeze and impairment – may be seen in other paediatric diseases. Therefore, not only the presence and absence of certain symptoms but also their frequency, severity, pattern (seasonal and diurnal) and trigger factors, are important when trying to differentiate the asthma syndrome in young children from other diseases or from symptoms in otherwise healthy children.

Standardised questionnaires (such as those on <http://www.asthmacontrol.com/AsthmaControlTestChild.html>; <http://www.asthmacontroltest.com/>) and combined scores of asthma symptoms such as wheeze, cough, breathlessness, restriction of activity during the day, and disturbed sleep/awakenings during the night, have been found to be of some use in older children and may diminish the problems with accurate assessment to some extent.^{4,11} The usefulness of such an approach has not been thoroughly validated in children under the age of four. However, combinations of different symptoms are likely to be more discriminative than just one or two separate symptoms; i.e. a child with both disturbed sleep, cough induced by cold air, and restriction of physical activity, is much more likely to have asthma than a child with only one of the symptoms.

It seems obvious that diagnosing asthma in children under five years of age in general practice will always be associated with some uncertainty. There are no reliable and specific tests, symptoms are often not specific for asthma, and their severity is difficult to assess. It must be remembered, though, that the two most common ‘conditions’ in children with symptoms suggestive of asthma in this age group are: a healthy child with worried parents and/or symptoms of a frequency and severity similar to what is seen in many healthy children; or, an asthma syndrome. Most of the important differential diagnoses mentioned in the paper by Bush are so rare that an average general practitioner (GP) will see at the highest one per year.

Although this all sounds quite discouraging, it is not impossible to make an asthma diagnosis with some certainty by combining risk factors with history and symptoms and a trial of treatment.

Figure 1 The value of different methods of differentiating a child with asthma from either a healthy child, or a child with an important asthma differential diagnosis, in children under five. The differentiation between the groups increases with an increasing number of positive factors: 1) a combination of symptoms (a child with both disturbed sleep, and cough induced by cold air and restriction of physical activity, is much more likely to have asthma than a child with only one of the symptoms); 2) including risk factors (parental asthma or eczema in the child); and 3) a ‘diagnostic trial’ with inhaled corticosteroids.

Thus, frequent episodes of wheeze (more than once a month), activity-induced cough or wheeze, nocturnal cough or awakenings in periods without viral infections, no seasonal variation in symptoms, and symptoms after the age of three, are all highly suggestive of (but not specific for) asthma. The presence of several of these symptoms in a child increases the likelihood markedly, as does the presence of eczema in the child or a history of asthma in one of the parents or a sibling^{11,12} (Figure 1). Finally, whenever in doubt, an eight-week ‘*diagnostic treatment trial*’ with a moderate dose of inhaled corticosteroids is normally helpful (Figure 1). Marked improvement of symptoms and recurrence when the treatment is stopped is highly supportive of an asthma diagnosis.

Conflict of interest declaration

Over the last five years Søren Pedersen has received lecture or consulting fees from Altana, AstraZeneca GlaxoSmithKline and MEDA.

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Søren Pedersen
Professor of Paediatric Respiratory Medicine,
University of Southern Denmark,
Paediatric Research Unit, Kolding Hospital,
DK 6000 Kolding, Denmark
Tel.: +45 7636 2223; fax.: +45 7636 3479
E-mail address: spconsult@post1.tele.dk

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