MANAGING ASTHMA IN CHILDREN: A FLEXIBLE APPROACH

In the final article of this two-part feature on the assessment and management of childhood asthma, the authors explain how a flexible approach to treatment will provide optimum disease control. Part 1, which focused on diagnosis, was published in the November/December issue of *BJFM*.

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Asthma is "a disease characterised by recurrent attacks of breathlessness and wheezing which vary in frequency and severity from person to person"[1] as defined by the World Health Organization. The challenges faced by practitioners in diagnosing asthma in children (especially in the under fives) were discussed in the previous article (*BJFM* November/December 2013). Once a diagnosis is established the next challenge is to create an individualised asthma management plan best suited to the needs of the particular child. The management of asthma should be guided by the BTS/SIGN guidelines.[2,3]

Multidisciplinary management

Asthma is a chronic disorder and the majority of children are managed in the primary care setting by their general practitioner. It is important that they are managed in a child-friendly environment and that health professionals are able to understand the child's and family's needs, thus improving compliance with treatment. While prescribing medications, it is equally important that families are given strategies that they can follow easily. Studies have pointed to the value of having dedicated asthma clinics in general practice, led by a GP with an interest in asthma and preferably including a nurse specialist to carry out regular reviews, monitor response to therapies and inhaler techniques and adjust drug dosages.[4] In a randomised controlled trial involving 107 children in the Netherlands (45 recruited from general practice and 62 from hospital), after two years follow-up, the degree of disease control in stable childhood asthma managed by an asthma nurse was found to be non-inferior to traditional management by primary or secondary care physicians.[5]

Maximising success of asthma treatment

The most important step in managing children with asthma is a clear and age-appropriate explanation about the diagnosis to children and their families, along with an understanding of how the families plan to balance management requirements against side effects and inconveniences of drug use.[2,6] It is important that side effects from use of pharmacological agents such as steroids are monitored if long term use is necessary.

Another aspect to successful management is that information should be delivered in such a way that the family can understand fully. We have met families who on the face of it had an "adequate" working knowledge of English and seemed to understand, but on closer questioning showed that fine details of what has been discussed had not been grasped. This problem may be overcome by the use of an interpreter for families who may not be proficient in English. In a survey in the US involving 107 participants, 51 surveys (48%) were completed by limited English proficiency (LEP) caregivers and 56 (52%) by English proficient (EP) caregivers.[7] A difference of 25% (p=0.01) in action plan use rates between LEP caregivers (39%) and EP caregivers (64%) was observed. The study found that compared with EP caregivers, those with LEP experienced disparate rates of asthma action plan use.[7] Pre-printed children's asthma management plans are available from Asthma UK (www.asthma.org.uk) and should be given to parents after proper explanation and checking understanding.[8]

In general the management of asthma in children should aim to:[3,6]

- minimise symptoms of asthma and reduce the impact on the child's lifestyle (i.e. school absences, active participation in sports, sleep, etc);
- reduce the frequency of need for reliever medications;
- prevent severe exacerbations (and hospitalisations).

Non-pharmacological measures

General measures that may be helpful in keeping asthma under control include minimising contact with environmental tobacco smoke and completing all routine childhood vaccinations (including yearly influenza vaccination). If the child with asthma is overweight, clinicians should discuss weight reduction to promote general good health, and this

may improve asthma control. Some older children in whom there is suspicion or evidence of house dust mite sensitivity may benefit from measures to reduce exposure, including complete barrier bedcovering systems and removal of carpets and soft toys from the bedroom – although firm evidence for these strategies is lacking. Finally, family therapy as an adjunct to pharmacological therapy may be beneficial in children with difficult asthma.[2,3,6]

Pharmacological management

Bronchodilators and steroid inhalers are the mainstay of asthma management in the majority of cases in the community. Younger children with predominant allergic symptoms (especially those under five years) for asthma exacerbation may benefit from a trial of montelukast therapy, instead of starting a steroid inhaler as the initial trial, and parents may accept this better. Escalation or stepping down of therapy should be guided by the response to treatment. However, a need for regular escalation of therapy or frequent exacerbations should lead to a review of the initial diagnosis, inhaler techniques and actual adherence to therapy.

Improving drug delivery

Considerations regarding the need for pharmacological therapy should be discussed and the most suitable delivery device should be employed depending on the age of the child. It is recommended that a spacer device be used in children of all ages for effective and controlled delivery of the drugs, as its usage improves drug delivery, minimises systemic drug side effects and reduces local side effects, such as throat irritation, hoarse voice and oral candidiasis.[13,14]

In adolescents and young persons, the use of a spacer may be impractical or not logistically possible, and other devices, such as Acuhaler or Turbohaler, may be necessary. However, even in adults studies show that spacer device use improves drug delivery and asthma control. In 2009 a study in Edinburgh, involving 3981 adult participants who were reviewed by specialist nurses in primary care (review included inhaler technique and asthma control), beclometasone taken via a spacer or breath-actuated device resulted in better asthma control than via a pressurised metered dose inhaler (pMDI) alone.[9]

While this may sound extremely basic to trained clinicians, it is important that fundamental facts regarding use of a pMDI and spacer device are explained properly to parents before initiation of therapy. This includes:[1,10]

- Shaking inhaler between each activation;
- Applying mask to face immediately after activating inhaler;
- Not giving it to crying infants;
- Counting to five slowly between each activation;
- cleaning the spacer device with washing up liquid and hanging it up to dry (do not rub it as this will cause scraping of inner surface of spacer device and reduce future drug delivery).

Explanation regarding types of inhalers

It is important to explain to the parents the difference between preventer and reliever medications. It is not uncommon for parents – and to a certain extent some clinicians – to remain unclear regarding the role of the therapies and use these interchangeably, leading to poor asthma control.[1,2,11] It is also important to give a clear written plan (if necessary in the parents' mother tongue) as to what should be done in the event of an asthma exacerbation. The BTS/SIGN guidelines (www.sign.ac.uk/pdf/sign101.pdf) should be followed in management of asthma[3] and the reasons and rationale behind any deviation from these recommendations should be clearly documented in the medical notes. A detailed discussion regarding BTS/SIGN guidelines on asthma management is beyond the scope of this article, and readers should keep themselves updated regarding any amendments made to the recommendations.

Bronchodilators

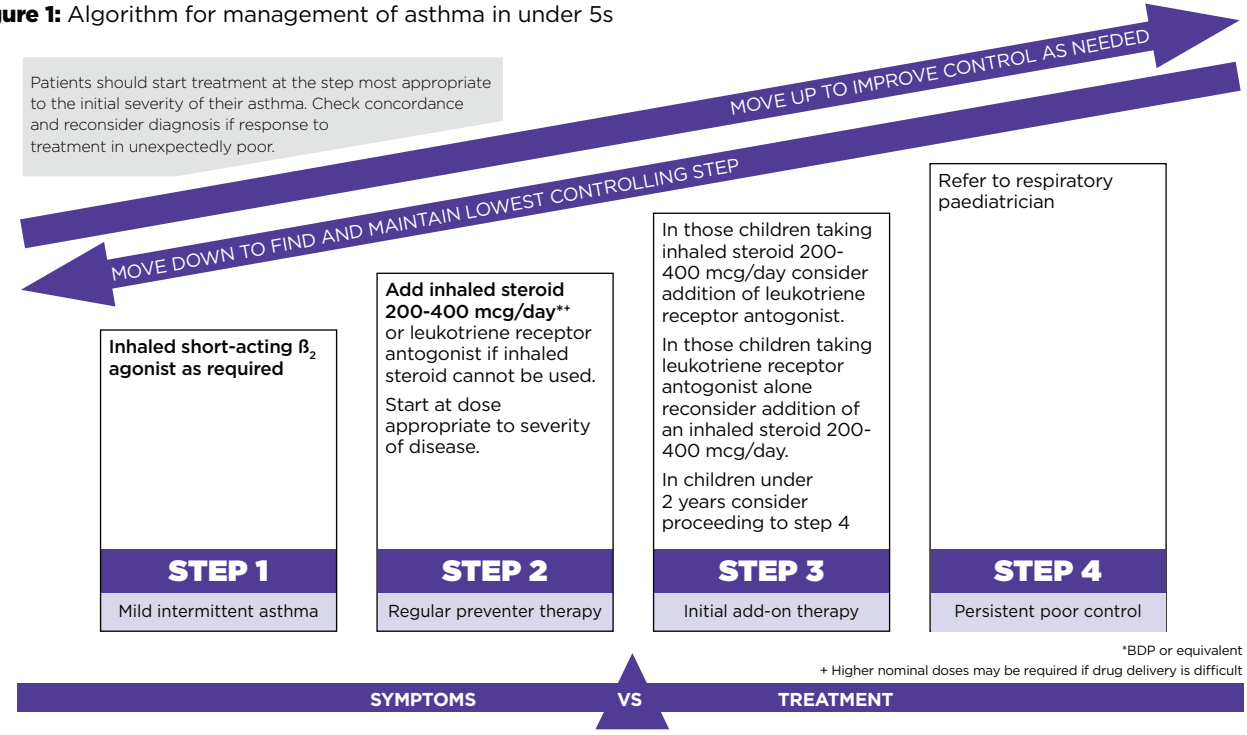
Salbutamol is the commonly used inhaled bronchodilator therapy in children. It is a short-acting β-2 agonist, has a rapid onset of action (within five minutes) and usually provides 4–6 hours of bronchodilation.[6] It should be used as a reliever therapy and is in the first step of BTS/SIGN guidelines on asthma management. It is important that while reviewing a patient with asthma, the practitioner establishes how often the child needs the reliever therapy. Need for frequent bronchodilator therapy, especially for interval symptoms such as exercise intolerance or night coughs, may indicate escalation of therapy – i.e. initiation of step 2 of asthma management.

Although it is not common practice to use bronchodilator therapy in oral (syrup) form in children, it may be necessary in some children who do not tolerate inhaled therapy.[3] Good oral hygiene will be all the more important for these children. Similarly, inhaled ipratromium bromide may be useful in some cases, especially during episodes of an asthma exacerbation. It is useful to use peak expiratory flow rate (PEFR) monitoring pre and post bronchodilator therapy (this can be generally achieved by children >5 years of age) to assess response to therapy. A 15% improvement is suggestive of airway reversibility in asthma.[3] Long acting β agonists (LABA) can be important in the management of asthmatic symptoms.

Steroids

Inhaled steroid therapy is necessary where frequent exacerbations are seen or there is a need for regular bronchodilator therapies especially for interval

Figure 1: Algorithm for management of asthma in under 5s



symptoms. Beclometasone, usually the first line steroid inhaler, should be started at a low dose via a spacer device. The rationale for its usage as a preventer therapy should be explained to the parents in simple, plain terms. It is important that while considering a change of the type of steroids or inhaler device used (e.g. Turbohaler, Easyhaler), equivalent doses of inhaled steroids relative to beclometasone are given before the change is initiated (see www.sign.ac.uk/pdf/sign101.pdf)[3] to avoid any inadvertent risk of overdosing with steroids.

Practitioners need to balance the benefits and risks for each individual child while on steroid therapy, and if the child remains symptom-free for more than a year, it may be appropriate to decrease and then stop the steroids and monitor the child regularly.[3] It is also important to take into account other topical steroid therapy (e.g. for eczema) when assessing for systemic risk. Steroid warning cards should be issued to patients on higher dose inhaled steroids, and at every review, signs of systemic steroid toxicity should be actively looked for.[3]

Any further escalation of regular asthma therapy should preferably be done in consultation with secondary care, especially in younger children. Guidelines recommend referral at step 4 or 5, but in practice, if a child does not "settle" with step 2 treatment, many primary care providers will choose to refer to secondary care for an opinion to establish the diagnosis of asthma and to rule out any other pathology. However, once these children are reviewed in secondary care and a clear management plan is drawn up, regular monitoring of asthma control can be undertaken in general practice with ongoing support from the secondary care services.

We suggest that any decision to make available a stock supply of oral steroids for use by parents at home without a concurrent review by a medical professional for asthma exacerbation should be made by the secondary care paediatricians. The BTS/SIGN guidelines on asthma management for children under five years and children aged 5-12 years are shown in Fig 1 and Fig 2 as a quick reference guide.

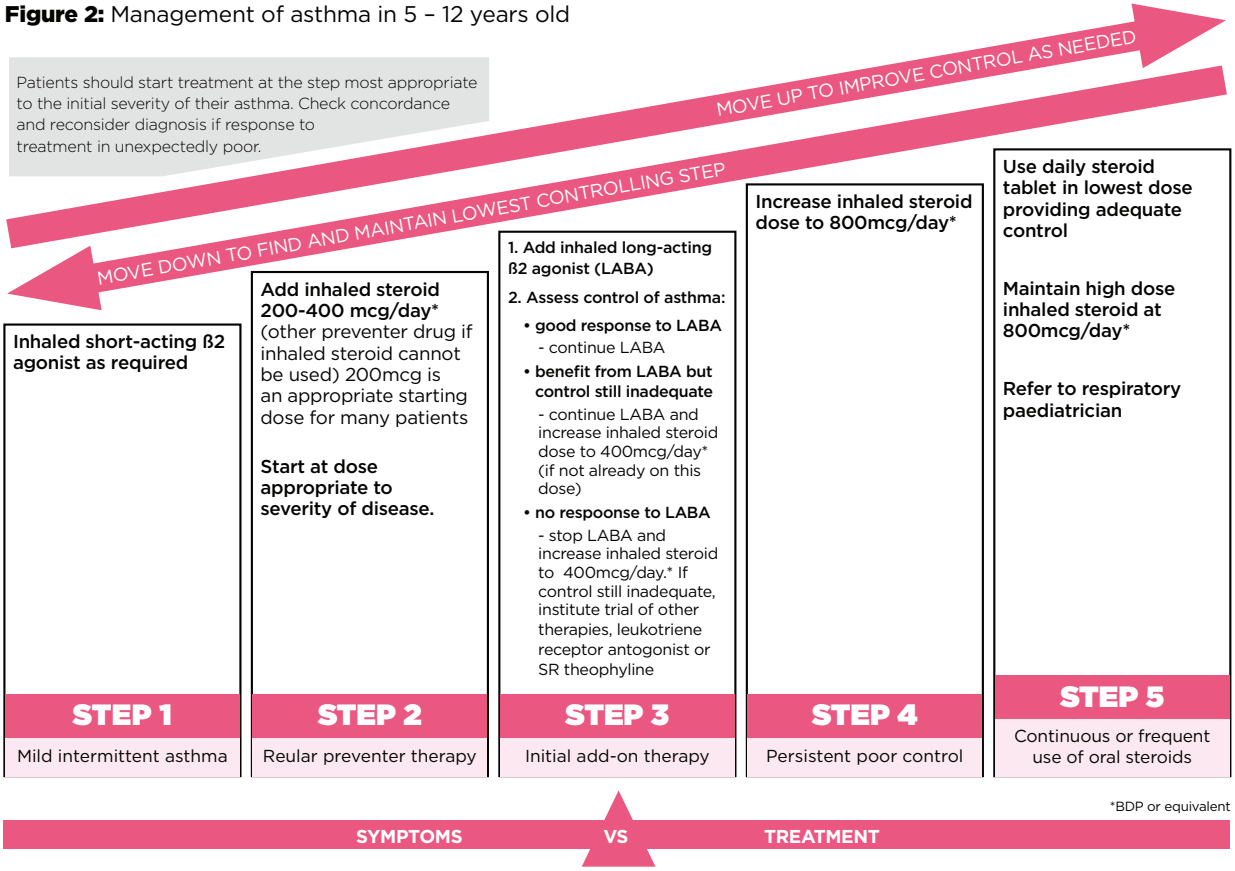
Management of acute exacerbations

Acute exacerbation of asthma often triggers a consultation with a health professional. The mainstay of management of acute exacerbation involves addressing the bronchospasm and ruling out infective causes during an acute episode.

Mild to moderate exacerbations of asthma in children with oxygen saturations >94% in air and who are clinically well may be managed with regular bronchodilator therapy via a spacer device with up to 10 puffs of salbutamol pMDI as required. The need to use bronchodilators more often than 4-hourly should be considered as a sign of deterioration in clinical status and the child should be referred or parents advised to take the child to hospital.

Specialist secondary care management is not within the realms of this article. However, as a general approach this involves stepwise escalation of therapy. This starts with regular use of inhaled bronchodilator therapy (sometimes as often as hourly) via a spacer device (even if the child normally

Figure 2: Management of asthma in 5 – 12 years old



does not use one at home). This may be escalated to regular nebulised bronchodilators and oral steroids.[3] Children with severe or life-threatening asthma exacerbation may need intravenous bronchodilators (salbutamol and/or aminophylline) and intravenous steroids. Magnesium sulphate – which has demonstrated variable improvement in patients with severe airflow limitation who are unresponsive to standard treatment with beta agonist, anticholinergic, and corticosteroid medications – does have a role in some cases but should be used with support from intensive care.

Conclusion

Asthma in children has long-term health implications. A flexible approach is necessary while managing asthma in primary care. Once a diagnosis of asthma is established, judicious use of therapeutic trials via a spacer device should enable successful management of most children in the community. An individualised written management plan should be given to the families, and monitoring should be carried out, preferably by asthma nurse specialist in general practice. BTS/SIGN guidelines should be used for the management of asthma in a child. Education and support for parents are of utmost importance to improve the adherence to treatment of asthma in children.

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