Case study: Charlie

About this case study

What is included in this case study?

This case study consists of materials to print out for use directly as they are, or for adaptation to suit particular audiences.

There are pages to print out to form hand out notes for participants, broken down into two parts.

Facilitator notes to print out are also included, to guide the leader of a discussion workshop based on the case.

Pages showing the case summary to prompt questions are also included. These are available as powerpoint slides.

Who can use this case study?

The materials are designed for use by a facilitator with a small group of health care professionals, such as practice nurses, hospital nurses working in respiratory and general medicine care, GPs and junior hospital doctors working with patients with asthma (eg those in paediatrics, respiratory medicine, geriatrics and A&E).

The group should be kept small enough to encourage participation in the discussion.

A group of 8-15 may be ideal, though the materials can also be adapted for use with groups of other sizes or with individuals.

Using this case study

This case study is designed to give plenty of opportunity to discuss asthma management and key points from the revised British Guideline on the Management of Asthma (2008).

The two parts of the case study should be handed out to participants progressively, so that the story unfolds and to allow for discussion around all the salient points.

After each part has been read, the facilitator may like to initiate discussion by posing questions. The facilitator notes give guidance on the points to bring out in the ensuing discussion. In addition to the key issues to be covered, other discussion points are suggested, together with practical issues that could be raised.

The case study should give ample opportunity to tailor the discussion to suit the needs and interests of the participants.

It is possible to use only one part of the case, if more appropriate for the participants concerned or if there are time constraints.

Learning outcomes

This case illustrates diagnosis of asthma in infants and management in young children, as well as highlighting the sub-optimal control that is the reality for many children with asthma. Asthma symptoms should not restrict activities and there should be minimal need for reliever treatment.

After completing the first part of the case, participants should be able to:

- Recognise the features that increase the probability of asthma in a child (BTS SIGN guideline section 2.1.1, page 2)
- describe causes of respiratory symptoms other than asthma in infants (BTS SIGN guideline section 2, table 3)

After completing the second part of the case, participants should be able to:

- detail the management of asthma in young children (BTS SIGN guideline section 4, figure 6)
- discuss the social, therapeutic and educational aspects of asthma in young children
- evaluate the need for regular review and specialist care in young children with asthma.

Part 1: notes for participants

History

Charlie, an 18-month old infant, attends the surgery with a troublesome cough, wheeze and breathlessness.

His mother said he developed eczema at the age of 2 months. From the age of 8 months he has suffered from intermittent but frequent chest symptoms. His mother described a pattern of recurrent symptoms typically a runny nose, followed by a cough and then within 12 hours the onset of wheezing and breathlessness. However, she has also noted some symptoms of coughing at night and after exercise at times when he does not have a cold. He has also had persistent rhinitis even when he does not have a cold.

At first he was not distressed by these symptoms, but for the last 3 months his activities (and particularly his sleep) have become increasingly disturbed.

His mother has asthma and uses a bronchodilator from time to time. His father had eczema as a child. His mother had tried giving Charlie her salbutamol through her spacer. She noticed that it had helped his symptoms.

Examination

Charlie's weight and length are on the 25th centile. There is mild sub-costal recession, hyperinflation of the chest with a prominent sternum and widespread wheeze. Apart from flexural eczema, there are no other abnormal findings.

Part 2: notes for participants

Diagnosis and management

A diagnosis of asthma was considered to be a high probability in view of Charlie's typical symptoms, the presence of wheeze and the history of a response to treatment with bronchodilators and personal and family history of atopy. (section 2, page 5 and figure 2)

His doctor decided to prescribe a therapeutic trial of corticosteroid 200mcg twice daily, given via a pressurised metered dose inhaler and a spacer with a face mask – in infants, this is the preferred method of delivery. The doctor explained to Charlie's mother that he was giving Charlie preventative treatment for asthma. He explained that they would have to check carefully to make sure that this improved Charlie. He arranged to see Charlie again in 2 months time. After 3-4 weeks, his mother noticed Charlie's symptoms settled and his sleep returned to normal. After 2 months, Charlie was assessed again. He had remained asymptomatic, so the dose of inhaled steroid was stepped down to 100mcg bd. (section 2, page 5 and figure 2)

Increasing symptoms

During the following years, Charlie experienced recurrent wheezy episodes that were managed by an increased dose of bronchodilators, and the occasional course of oral steroids. By the age of 5 years, Charlie had started school, but he was not very happy there. He found it difficult to join in the games at break times because he became breathless. He was symptomatic on exercise despite using inhaled steroids at a dose of 200mcg twice daily.

Part 1: facilitator's notes

The key questions for discussion are listed below, with points that should emerge during the discussion. A number of other topics that could be discussed, together with practical issues, are also indicated.

In a young child, such as Charlie, a definitive diagnosis of asthma can be difficult to obtain. However, asthma should be suspected in any child with wheezing, ideally heard by a health professional on auscultation, and distinguished from upper airway noises. Charlie has other features that increase the probability of asthma particularly the history of other atopic illnesses. (section 2, pages 2-5 and figure 2)

How do you eliminate most of the possible causes of Charlie's symptoms?

Symptoms were not present from birth or in the perinatal period. There is no evidence of failure to thrive and no persistent wet cough making the diagnosis of cystic fibrosis unlikely. There are no focal signs in the chest, suggesting that the cause is not bronchiectasis or tuberculosis. Excessive vomiting is not reported, suggesting that the cause is not reflux with recurrent aspiration. Charlie's voice and cry are normal, so there is no evidence of a laryngeal problem. (section 2, table 3)

Practical discussion point

How feasible are objective tests for asthma in young children? Although assessment of peak flow variability is not possible in infants or in most children under 5 years old, recording the presence of clinical signs and response to treatment may provide some measure of objective testing. (section 2, pages 6 and 7)

Based on the initial clinical assessment it should be possible to determine the likely probability of a diagnosis of asthma. In Charlie's case this would be highly probable. The appropriate next steps would be to start a trial of treatment and then review and assess the response to treatment. Failure to respond to treatment should encourage clinicians to reconsider whether the diagnosis is correct.

What questions do you ask about the family and the home?

There is already evidence of atopy, with the eczema suffered by Charlie and of atopic illness in his family. It is also useful to ask about family history of atopy and potential allergies. Consider possible trigger factors, so ask about pets and other allergens. Although there is only 'tenuous' evidence of their effectiveness, well motivated families could try avoidance strategies such as barrier bed covering systems, removal of carpets and soft toys from the bedroom and high temperature washing of bed linen. Expensive vacuum cleaners (like those with a HAD filter) are not generally effective at removing dust mite allergen. (section 3.2, pages 27)

Ask about smoking habits among the family and carers. Parents who smoke should be advised of the many adverse effects of smoking for themselves and on their children, including increased wheezing in infancy, and be advised and given appropriate support to stop smoking. Smoking cessation should be encouraged as it is good for the general health of the parents and may decrease asthma severity in children. (section 3.3.1, page 28)

Practical discussion point

How practical are measures to reduce house dust mite? Do vacuum cleaners effectively remove house dust mites? (section 3.2.1, page 27)

Key point

The revised guidelines suggest that based on the initial clinical assessment it should be possible to determine the probability of a diagnosis of asthma. In Charlie's case this would be highly probable and so a trial of treatment would be the next step. Further details on SIGN and BTS websites (www.sign.ac.uk and www.brit-thoracic.org.uk)

Part 2: facilitator's notes

The key questions for discussion are listed below, with points that should emerge during the discussion. A number of other topics that could be discussed, together with practical issues, are also indicated.

Charlie's early symptoms are persisting into childhood, and becoming more troublesome. Already on step 2 (regular preventer therapy) it may now be time to consider add-on therapy and a move up to step 3.

Practical discussion points

In practice, how easy is it to use a spacer device with face mask in an infant? Any practical tips on coaxing infants to cooperate? How should spacers be washed? At what age is the face mask inappropriate?

Are oral ß-agonists or theophyllines appropriate therapy for infants such as Charlie?

What do you think is the most appropriate next step for management of Charlie's symptoms?

Before altering therapy, it is important to check compliance with medication and inhaler technique – Charlie could be refusing to use the spacer and may respond if the device is changed to something with a more 'grown up' feel. Any increased exposure to allergens should also be explored – is there a hamster or other new trigger in Charlie's classroom?

Is the diagnosis correct? This case illustrates the importance of careful documentation so that the process of arrival at the diagnosis can be reviewed and revisited. Other possibilities for the diagnosis should be reconsidered.

Does Charlie have a written asthma action plan that his parents understand and are willing to implement? If not, this should be addressed, ensuring that the parents understand the roles of the preventer and reliever inhalers.

Assuming these factors are excluded, a trial of additional treatment should be carried out before increasing the dose of inhaled steroid above 400mcg/day. The first choice of add-on therapy to inhaled steroids in children from the age of 5 years is an inhaled long-acting β^2 agonist (section 4 figure 5).

Practical discussion points

At what age can peak flow meters be reliably used with children? As they move out of the infant stage, do children have the opportunity to choose a dry powder or breath-actuated device, or is there pressure from the practice to stick to a low cost pMDI+spacer? Should the attitude of the school to inhalers be explored? Charlie may need a puff of reliever before break times and physical education lessons. His asthma action plan should be updated and a copy given to the school.

Should Charlie be referred for specialist assessment?

Assuming that Charlie responds to the add-on therapy, there is no need to refer him for specialist assessment. However, if his response is sub-optimal despite add on therapy, specialist referral should be considered (section 2, pages 2-10).

Key points

- Add inhaled long-acting β^2 agonists rather than increasing dose of inhaled steroids (above 800mcg/ day in adults and 400mcg/day in children)

Further details on SIGN and BTS websites (www.sign.ac.uk and www.brit-thoracic.org.uk)

Part 1: case summary

18-month old infant with cough and wheeze and a history of eczema. Family history of asthma and eczema

o/e Mild sub-costal recession, hyperinflation of the chest with a prominent sternum and widespread wheeze

Evidence of eczema

Part 2: case summary

Diagnosed with asthma

Age 5 years, starting school, control lost

Symptomatic with inhaled corticosteroids 200mcg bd

Part 1: questions

How do you eliminate most of the possible causes of Charlie's symptoms? What questions do you ask about the family?

Part 2: questions

What do you think is the appropriate next step for management of Charlie's symptoms? Should Charlie be referred for specialist assessment?

Part 1: key point

Diagnose before treating – based on the initial clinical assessment it should be possible to determine the probability of a diagnosis of asthma. The need for and nature of further objective tests depends on the age of the child and your assessment of this probability. In children with a high probability of asthma, the next step is a trail of treatment with careful clinical evaluation of the response.

Further details on SIGN and BTS websites (www.sign.ac.uk and www.brit-thoracic.org.uk)

Part 2: key points

Add inhaled long-acting β^2 agonists rather than increasing dose of inhaled steroids (above 800mcg/day in adults and 400mcg/day in children) in children from 5 years onwards

Families with evidence of house dust mite allergy and who wish to try mite avoidance might consider the following:

- complete barrier bed-covering systems
- removal of carpets
- removal of soft toys from bed
- high temperature washing of bed linen
- acaricides to soft furnishings
- good ventilation with or without dehumidification.

Further details on SIGN and BTS websites (www.sign.ac.uk and www.brit-thoracic.org.uk)