



Community Paediatric Review

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Asthma in children

The prevalence of asthma is increasing in western countries. Over two million Australians suffer with asthma, and one in every four to five children will have some asthma symptoms at some stage. The Federal Government has identified asthma as a national health priority area, and \$48 million was recently allocated to support general practitioners in providing high quality care to patients with asthma using the "Three Plus visit plan". Asthma is the commonest medical reason for children to be admitted to hospital. Asthma is clearly a major paediatric health problem, and it is important for community nurses to be up to date with current asthma best practice management to be able to advise parents.

There are various ways of defining asthma, but the most practical clinical definition is "recurrent episodes of cough, wheeze and shortness of breath that respond to bronchodilator therapy". The commonest trigger of an acute episode in children is a viral upper respiratory tract infection (URTI). Important predisposing factors include a genetic predisposition (unavoidable), allergies to inhaled allergens particularly house dust mite (very hard to avoid), and passive exposure to cigarette smoke (avoidable). About 80% of children with asthma will have symptoms with exercise, which can become an increasing problem in school-age children.

Many young children have recurrent cough, which is usually due to viral URTI rather than asthma unless there is associated wheeze. It is important not to over attribute cough to asthma, as this frequently results in unnecessary treatment. The cardinal symptom of asthma is wheeze. Conversely not all

wheeze is due to asthma. Infants with persistent wheeze present a diagnostic challenge. Serious problems such as recurrent aspiration, cystic fibrosis and cardiac failure need to be considered. Many infants have a wheeze that is unresponsive to bronchodilators. This appears to be due to congenitally small airways, and has been associated with maternal cigarette smoking during pregnancy. The outlook for these infants appears to be generally good, with resolution of wheeze over the first couple of years.

The commonest pattern of asthma in childhood is discrete episodes triggered by viral URTI. Typically the child will begin to cough and wheeze soon after the onset of a runny nose, and this may last for several days. These children generally have none or only trivial symptoms in between URTIs. A small number of children with asthma have frequent interval symptoms (ie. cough, wheeze and shortness of breath) between URTIs. This is called persistent asthma.

Therapies

All children with asthma should have an individualised management plan. For the majority (ie. those with infrequent episodic asthma) this will simply involve an inhaled bronchodilator such as Salbutamol (Ventolin) for symptomatic relief. The best means of delivery is via a metered dose inhaler (puffer) with a spacer device. Infants and young children should use a close fitting face mask. From 2½ to 3 years of age most children can be instructed to breathe in and out through a valved spacer. One puff should be delivered at a time, and the child then takes five or six

NOTE:

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normal breaths. The face mask must be applied firmly to the face to achieve delivery of the drug to the lungs. One puff at a time should be delivered. Generally two puffs are sufficient; however for more severe symptoms four or six puffs may be required.

The other important medication to help resolve an acute attack is oral Prednisolone. A dose of 1mg per kilogram is normally administered for up to three consecutive days. This has excellent anti-inflammatory properties and may prevent children needing to be hospitalised. Parents who have experienced repeated attacks may initiate the first dose at home. A doctor should always assess the child if Prednisolone has been given. It is quite safe for children to have several brief courses of Prednisolone each year.

Children with frequent interval symptoms or persistent asthma may benefit from preventive therapy. The best preventer is an inhaled corticosteroid such as Budesonide (Pulmicort) or Fluticasone (Flixotide). Some children also require a long-acting beta agonist such as Salmeterol (Serevent). A combination inhaled steroid and long acting beta agonist have recently become available (Seretide) and may result in improved compliance.

It is important for staff at child care centres, kindergartens, schools, and community recreational facilities to be trained in the emergency treatment of an asthma attack, and to have a bronchodilator and spacer device available. Generic first aid consists of the four by four by four approach: give four puffs of a reliever (bronchodilator eg. Ventolin), one puff at a time, with the child taking four breaths per puff. This should be repeated every four minutes until there is relief. If there is no improvement an ambulance should be called, and four puffs should continue to be given every four minutes until the ambulance arrives. Childhood asthma deaths are rare but do still occur.

Summary

Children with asthma should be able to participate in and enjoy all normal childhood activities. Optimal asthma management should ensure a high quality of life for all children with asthma. Community nurses can play an important role in educating parents about this important condition.

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Reflection questions:

Please use the following questions to reflect on your current practice as a health promoting nurse in light of this asthma "update".

- 1. How would you promote the GP "Three Plus visit plan" to families?*
- 2. How would you as the community health nurse work with the child and his/her parents to assist with the child's sense of empowerment with relation to asthma, it's prevention, management and understanding of the condition, considering the child's developmental stage?*
- 3. Using the Ottawa Health Charter as the underpinning philosophy, how would you work with children and parents to educate them about the preventative aspects of asthma, it's treatment management and management when an acute episode occurs?*
- 4. How would you work with clients who smoke during the transition to parenthood, and after the birth of the baby?*
- 5. How might continuity of care issues impact on the relationship between the carers of a child with asthma?*

NOTE:

You can email your responses to the "Reflection Questions" for both articles, and/or general comments to cpreview@cryptic.rch.unimelb.edu.au.

Your responses will be placed on the "CPR Notice Board" at www.rchmelb.org/ccch/pub

Gastroenteritis in children

Gastroenteritis a common infection of the gastrointestinal tract, is easily spread amongst young children because of inadequate handwashing, frequent hand to mouth play and eating activities. Although usually benign and self limiting it can cause serious illness, especially in the very young.

The most common cause is rotavirus, but a range of other viruses and bacteria may be implicated. Bloody diarrhoea is more likely to be caused by bacterial infection eg campylobacter.

Children may vomit early in the illness, and parents often consider vomiting to be the main problem. However the cardinal feature of gastroenteritis is diarrhoea and the associated fluid loss is the main contributor to dehydration. Early symptoms of nausea, vomiting, cramping abdominal pains and often fever quickly progress to diarrhoea which may persist for up to 10 days.

Be wary of making a diagnosis with vomiting alone. Other causes include sepsis such as urinary tract infection, generalised viral infection or meningitis, surgical conditions such as pyloric stenosis (in young babies), intussusception, or appendicitis, severe systemic illness or poisoning. Diarrhoea alone may be due to lactose intolerance, constipation with overflow (spurious diarrhoea) or the more rare inflammatory bowel disease.

Assessment

1. Diagnosis.
It is important to consider the positive signs of gastroenteritis as well as the lack of signs of other conditions.
2. Degree of dehydration.
Clinical signs are notoriously inaccurate, and a recent decline in body weight is the best indicator. For this reason, frequent review eg 6 – 12 hourly may be necessary for very young children and for older children who pass copious amount of fluid diarrhoea. Accurate weighing with all clothes removed or the same underwear is essential.
 - Mild dehydration (less than 4%) – no clinical signs.
 - Moderate dehydration (4 – 6%) – dry mucous membranes, sunken eyes, passing less urine.
 - Severe dehydration (7 – 9%) – cool peripheries, decreased skin turgor, impaired peripheral circulation, sighing breathing.
 - Shock – circulatory collapse requiring urgent intravenous resuscitation.

Management

The mainstay of management is fluid replacement. There is no requirement to dilute or exclude milk or other foods. Children may be anorexic initially, but should eat their normal diet once hunger develops. **Breast feeding should be continued.**

There is no indication for anti-vomiting or anti-diarrhoeal agents, which are ineffective and may be harmful. Antibiotics are occasionally used for specific bowel infections eg giardia.

The principle of fluid replacement is offering small amounts frequently, whether using breast milk, formula or the clear fluids additionally advised.

Clear fluids

Although oral rehydration solutions such as Gastrolyte or Repalyte are often advised, in practice children who are not or only mildly dehydrated often refuse to drink them because of taste.

Clear fluids familiar to the child will be accepted, but must be diluted to ensure a glucose solution of about 2%. Higher sugar content will draw fluid into the bowel from the tissues and contribute to further fluid loss (osmotic diarrhoea). Salt must not be added at home as the risk of salt overload is very high.

Clear fluid	Dilution
Sugar solution	1 teaspoon table sugar to 1 cup of water
Cordial (not low calorie)	1/4 cup cordial to 4 cups of water
Lemonade (not low calorie)	1 cup lemonade to 4 cups of water
Fruit juice	1 cup juice to 4 cups of water

Fruit juice should not be given for the first time to young babies during a bout of gastroenteritis, partly because it is not recommended in the diet of children less than 6 months of age and partly because some children are sensitive to the fruit sugars.

Referral

Children should be reviewed by a doctor if the diagnosis is unclear, if dehydration is suspected or present, if symptoms persist, or if the child appears more unwell than expected from the history given by the parents. If hospital admission is required, most children can be managed by oral or rapid nasogastric rehydration, the exception being shock requiring intravenous resuscitation.

Prevention

Viral gastroenteritis in particular is often highly infectious, with spread by the faecal oral route. Families need to be reminded of the need for effective handwashing, and to avoid contact with groups of children eg in child care, children's parties, or/and after school care.

Follow up

As previously mentioned, children should continue eating their normal food as soon as possible. Some young children prefer a bland low fat diet during this time eg baby rice or cereals, stewed fruit, dry biscuits, bread or toast without butter or margarine, potato and lean meat and fish.

Very young children (usually less than 6 months) are at risk of developing lactose intolerance as a result of damage to the bowel wall. They may continue to have loose frothy stools, often associated with inflammation around the anus, after the gastroenteritis has resolved. It is important to test for lactose intolerance in order to make a specific diagnosis before suggesting a change to a lactose free formula.

In summary

Gastroenteritis is a common infection, often occurring in small epidemics. The mainstay of treatment is accurate diagnosis, prevention of dehydration by offering small but frequent amounts of clear oral fluids, early feeding of solids, and recognition and referral of dehydrated children, particularly young babies. A small number of young children become dehydrated very quickly with excessive diarrhoea and frequent review is required to monitor progress. Most children even when admitted to hospital can be managed with oral or nasogastric rehydration.

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Reflection questions:

Please use the following guidelines to reflect on your current practice as a health promoting nurse in light of this gastroenteritis "update".

1. What anticipatory guidance would you give a caregiver in relation to the causes of gastroenteritis?
2. How would you manage within your practice setting a caregiver who is using inappropriate strategies for managing a child with diarrhoea? For example, the use of 'flat' lemonade.
3. How will you assist in the development of parental skills with diverse groups about the prevention and management of gastroenteritis, for example dealing with cultural and religious beliefs?
4. What clinical assessment and information will you gather in order to diagnose gastroenteritis?
5. What information would you provide to the caregiver in relation to managing the home environment and other children in the family with diarrhoea?

Parent information

There are a number of web-based fact sheets which are useful for parents to take home, such as:

- *Gastroenteritis in children, The Children's Hospital at Westmead, NSW*
www.nch.edu.au/parents/factsheets/gastroj.htm
- *Gastroenteritis, Child and Youth Health, SA*
www.cyh.com/cyh/parentopics/usr_index0.stm?topic_id=130
- *Gastroenteritis in children, Better Health Channel, Vic*
www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/pages/Gastroenteritis_in_children