ABC of 1 to 7

H B VALMAN

CHRONIC DIARRHOEA

Diarrhoea which lasts longer than two weeks can be called chronic. To provide perspective diarrhoea starting at any age will be discussed here. In Britain chronic diarrhoea with normal growth between the ages of 1 and 3 years is usually of no sinister significance. It is popularly known as "toddler diarrhoea" and is probably due to failure to chew food. In developing countries chronic diarrhoea is often caused by acute or chronic intestinal infection. In all parts of the world acute gastroenteritis may be followed by chronic diarrhoea, and the importance of cows' milk protein intolerance and secondary lactase deficiency as causes of this syndrome is controversial. Malabsorption may be presumed if there is chronic diarrhoea and the growth chart shows inadequate weight gain. Coeliac disease and cystic fibrosis are both uncommon; each occurs in about one in 2000 children.

History and examination

The history should include an inquiry about the duration of the symptoms; the frequency, consistency, and colour of the stools; and whether any fluid is present with the stools. The date when the first gluten was eaten and the detailed diet of an average day need to be recorded. The presence of recognisable foods such as beans, peas, or carrots in the stool is noted. Details of medicines and diets prescribed should be considered.

There are usually few abnormal signs. Abdominal distension and wasting, particularly of the inner aspects of the thighs and of the buttocks, should be noted.

Investigations in children over 1 year with normal growth

Growth as shown on a growth chart is the most valuable single investigation. The chart can often be completed from measurements already taken at the local clinic. If growth is normal severe malabsorption due to coeliac disease or cystic fibrosis is unlikely. A normal growth chart and the presence of recognisable food in the stools suggests that the child has toddler diarrhoea. This is probably due to failure to chew well and resolves spontaneously. Apart from examining the stools for pathogens, including *Giardia*, repeat measurements of growth are the only investigation required.

If no recognisable food is present in the stools sucrose and lactose tolerance tests need to be performed (see below).

Investigations in children under 1 year or those with poor weight gain

The stool should be examined for parasites including *Giardia* and cultured for pathogens including pathogenic *Escherichia coli*. Blood is taken for a full blood count, erythrocyte sedimentation rate, platelet count, and plasma albumin estimation. A sweat test is performed and, if the result is normal, separate sucrose and lactose tolerance tests. (In some patients jejunal biopsy may be performed before sugar tolerance tests.) Severe diarrhoea during the 24 hours after a test dose of the sugar suggests intolerance, and the fluid part of the stool should be examined by Clinitest and sugar chromatography. A concentration of more than 0.5% of reducing substances in the stool indicates intolerance to that sugar. Serial blood glucose estimations during the tolerance tests are not performed because they give misleading results. All these tests can be carried out in the day care unit or outpatient department.

If the sweat test and tolerance tests are normal jejunal biopsy is considered. Some units carry out biopsies safely in the day care unit but others admit the child. Stool collections for fat excretion are no longer used as a screening test for coeliac disease. It is difficult to obtain complete collections of stool, and a poor appetite due to an infection caught in the ward often results in an inadequate fat intake. Most laboratories resent doing faecal fat estimations.

A completely flat biopsy, devoid of villi, suggests that the child has coeliac disease. Less severe abnormalities may be found in a wide variety of problems, including gastroenteritis, iron deficiency anaemia, malnutrition, and cows' milk protein intolerance. In these conditions the lesion may be patchy so that a single biopsy may fail to show an abnormal area.

Normal

Flat

Cystic fibrosis

In Britain cystic fibrosis is the most common autosomal recessive disease in man. An abnormal gene is inherited from each parent, who is clinically normal, and the risk of a recurrence in each subsequent pregnancy is one in four. A high sweat sodium concentration is essential for making the diagnosis. If the infant presents with malabsorption due to pancreatic insufficiency vigorous prophylactic treatment of the lungs can be started at an early age and may prevent or limit the development of chronic lung disease. The extent of permanent lung damage determines the ultimate prognosis but 75% of children are now reaching at least the teenage years, probably as a result of more aggressive treatment in the early years. The relation between the high sweat sodium concentrations, preventable chronic lung disease, and pancreatic insufficiency is unknown. There is no method for antenatal diagnosis and no reliable neonatal screening test. The steatorrhoea is improved symptomatically by giving a low fat diet with supplements of pancreatic extract. Prevention of chronic lung disease depends on regular physiotherapy given by the parents with the liberal use of antibiotics. An antibiotic, usually cloxacillin or erythromycin, is given during every upper respiratory tract infection and during the subsequent two weeks.

Coeliac disease

In coeliac disease malabsorption is associated with a small intestinal mucosa which is completely flat on diagnosis, improves on a gluten-free diet, and relapses on challenge with gluten powder. There may be several years between the reintroduction of gluten and the recurrence of diarrhoea. The infants usually present between the ages of 5 and 7 months but may be seen for the first time at any age. Ideally the diagnosis should be confirmed by three jejunal biopsies and if it is proved a gluten-free diet is needed for life. Especially in children aged under 1 year, a flat jejunal biopsy can be found in other diseases such as gastroenteritis or cows' milk protein intolerance, and for this reason three biopsies are needed.

Cows' milk protein intolerance

The prevalence of intolerance to cows' milk protein varies widely according to different workers but is probably about one in 1000 infants. Diarrhoea starts between birth and 6 months. The intolerance resolves by the age of 2 years. Although many abnormalities have been described in laboratory tests none of the tests are easily available or reliable for routine clinical care. The diagnosis depends on withdrawing all products containing cows' milk and challenging the infant with 5 ml of milk while he is under close supervision in a day care unit or ward. If severe diarrhoea occurs within 48 hours the diagnosis is confirmed and a cows' milk-free diet supervised by a dietitian prescribed. Infants under the age of 1 year may need a milk substitute and a soy-based preparation is often used, although up to half of these families eventually become intolerant of it. The cows' milk challenge is repeated every two to three months until the infant can tolerate it.

Infants with cows' milk protein intolerance may also have secondary lactase deficiency. This must be distinguished from isolated lactase deficiency of genetic origin, which causes diarrhoea after the age of 2 to 3 years. This type is extremely common in a variety of ethnic groups throughout the world but is not found in Caucasian races.

Dr H B Valman, MD, FRCP, is consultant paediatrician, Northwick Park Hospital and Clinical Research Centre, Harrow.

The photographs of jejunal biopsy specimens were reproduced by permission of Dr G Slavin.