Investigation of chronic diarrhoea

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Abstract

Chronic diarrhoea occurs, by definition, when there is an excessive intestinal loss of water and electrolytes with increased stool frequency, reduced consistency and larger volume over more than 14 days. While in developing countries often resulting from persisting infectious gastroenteritis in high incidence, in industrialized countries chronic diarrhoea is mainly related to anatomical, functional, and immunological causes. As the spectrum of aetiology is variable, flow charts for different age groups are useful in determining key features of disease severity and diagnostic criteria. The knowledge of common and rare aetiologies enables a structured approach to investigation, and facilitates critical interpretation of results in awareness of diagnostic pitfalls. Comprehensive history, physical examination, inspection and collection of stool samples of sufficient volume are pivotal to devise appropriate referral modes for diagnostic and therapeutic management, as particularly newborn and infants are susceptible to severe dehydration and metabolic disturbances.

Keywords chronic diarrhoea; dehydration; electrolyte disturbances; faecal calprotectin; malabsorption; osmotic; secretory

Introduction

Irregular bowel habits of their children are one of the most frequent concerns for parents when they consult a health visitor, primary care physician (GP), paediatrician or gastroenterologist. In this article we describe the background, definition, and approach to chronic diarrhoea. We give practical guidance to distinguish the literal diagnosis of chronic diarrhoea from other conditions which appear similar according to the age group, and we provide an overview of common and rare aetiologies.

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Definition

Chronic diarrhoea occurs, by definition, when there has been increased daily amount of stool, particularly of faecal water (more than 10 ml/kg), which results in reduced consistency and increased stool frequency for more than 14 days in the absence of positive stool culture results for enteropathogenic viruses, bacterial enteritis, and protozoae. The definition also excludes individuals with isolated colitis, which typically presents with bloody-mucousy diarrhoea in children typically normal thriving and eating.

Normal frequency of stool passage in children

The normal frequency of stools depends on the child's age, nutrition, fluid intake, hereditary factors, in addition to specific conditions described in this article. There is a wide variation in the 'normal range' which is summarized in Table 1.

Consistency, colour and odour

Diarrhoea can be associated with a particular and often unpleasant smell. It is worth noting whether parents or children have noted foul, sour, smelly stools, with or without flatulence. The colour is highly variable and is influenced by the presence of blood and bile or stercobilin. Blood results in either red (from fresh blood) or black (melaena) stools but other possible colours include white (acholic), yellow, green, or brown. Clinically, only acholic, bloody (red) and black stools are of significance, the colour of green stools as an indication of pathology is overstated, as green-coloured stools are not only present in bacterial gastroenteritis (e.g. Salmonella), but also in children with hydrolysed milk formulae, and as a variation of normal stools.

The presence of mucus either mixed in with or coating the stool suggests irritation of the colon, associated with a number of conditions (irritable bowel syndrome, colitis, polyp, and others). Observation of undigested contents (peas, carrots, corn, tomato, grape, peppers) is typically seen in conditions with increased bowel motility, also referred to as "toddler's diarrhoea". Malabsorption of fat typically gives an oily appearance with stools that are difficult to flush away but these features may be overlooked by parents and children themselves who are old enough to attend to their own toileting needs (Box 1).

Associating conditions

Diarrhoea is a very common symptom, which is frequently associated with other symptoms or signs, either concomitantly, or sequentially, and may provide clues to an underlying aetiology or suggest further investigations. Whilst a complete list is not possible some of the commoner associated symptoms and signs are listed in Table 2 which proposes what further tests may be helpful.

Frequency of defecation in normal, healthy children

Age group	Minimal	Maximal
Infant breast-fed	1 per 10–14 days	10 per day
Infant/toddler (3 yr)	1 per 2 days	3–4 per day
Older children	3 per week	3 per day

Table 1

Ten key features in the history

Ask about:

1. The onset. In particular, did it occur from the neonatal period or was it influenced by a change of infant formula or diet.
2. Any 'infective' episodes.
3. Medication use.
4. Pregnancy and birth. In particular check whether there was polyhydramnios, prematurity, and the timing of meconium passage.
5. Development. Plot the growth and check overall development.
6. Other medical conditions.
7. Type of feeding, what type of milk, changes in carbohydrates (fructose, lactose, saccharose), gluten, proteins (cow's milk, soya, egg), and fluid intake.
8. Infections, parasites, travel?
9. Other family members/contacts affected? Consanguinity, ethnicity, allergies, chronic inflammatory bowel disease, coeliac disease, first-grade relatives affected with chronic diarrhoea.
10. Stool history: frequency, consistency, colour, flatulence, pain.

Box 1

Delayed diagnosis of chronic diarrhoea

It is not uncommon to be faced with a child who has had symptom for a long time prior to a review. There are many reasons why the diagnosis may be delayed. In younger children stool may be absorbed by the nappy or mistaken as urine. New parents without previous experience of 'what is normal' often ignore symptoms accepting them as part of the normal experience of having a small baby. Once toileting occurs independently then younger children may be too anxious to acknowledge symptoms and adolescents often refuse to examine faecal consistency or discuss it.

Being certain that this is really chronic diarrhoea

It is pivotal to the correct diagnosis and to ascertain that the child really suffers from chronic diarrhoea, because there are misconceptions among patients, parents, caregivers and health professionals. The term "diarrhoea" is often incorrectly used for various reasons:

- It is used by families as a relative term (consistency more liquid than in comparison to what the individual perceives as a "normal" stool).
- To stress the urgency of the symptom/unwell-being of the child.

Association of conditions in association with chronic diarrhoea

Area	Symptom	Association	Further tests
Systemic	Fever	Infection	Stool culture, infection screen, Faecal calprotectin
Weight	Static, loss	Malabsorption, maldigestion	Nutrition protocol, stool tests
Height	Static	Chronic malnutrition	Multiple organ systems
Head circumference	Disproportional	Hereditary and acquired	Growth charts
Abdominal	Pain, vomiting	Triggers, time	Imaging, endoscopy
	Distension, flatulence	Malabsorption, bacterial overgrowth	Faecal reducing substances, hydrogen breath tests
	Energy drop, appetite, food refusal	Hereditary and acquired	Blood tests, faecal calprotectin
Skin	Eczema	Food allergy	History, change of formula, allergy tests (blood, skin)
	Pallor	Vitamin deficiency	Iron status, Vitamin B12, folic acid
	Oedema	Hypoproteinaemia	Protein, albumin, α1-antitrypsin in blood and stool
	Infection	Immune or zinc deficiency	Immune status, zinc
	Bleeding signs	Vitamin K deficiency, malignancy	FBC and clotting
	Erythema nodosum, pyoderma gangrenosum	Chronic inflammatory bowel disease	Faecal calprotectin, endoscopy
	Clubbing	Cystic fibrosis, Crohn's, short gut	
	Abdominal scars	Bowel resection, short gut	Obtain details of resected area
Anal	Prolapse	CF, parasites, coeliac disease	Endoscopy
	Skin tag, fissure, fistula	Crohn's disease	Faecal calprotectin, endoscopy
	Anogenital malformation	Hereditary, e.g. VACTERL	Inspection, imaging
Hydration	Heart rate, blood pressure, temperature, capillary refill time	Decision about oral, combined or parenteral hydration and nutrition	Baseline biochemical and metabolic profile

Table 2