Current Practice

CHILD CARE IN GENERAL PRACTICE

Diarrhoea, Acute and Chronic

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Diarrhoea in children may be due to a local disorder—that is, infection or irritation of the bowel wall from ingested pathogens or toxins—or it may be a symptom of a general disorder, somatic or psychogenic. The bowel wall may be inherently normal, as in dysentery or food-poisoning, or abnormal, as in fibrocystic disease of the pancreas and coeliac disease. Diarrhoea may be acute, when there is danger from excessive loss of water and electrolytes, or chronic, when the important effects are usually the result of malabsorption.

Acute Diarrhoea

Unwise Eating

Brief and trivial episodes of diarrhoea, often with abdominal pain and vomiting, are common. Though the mother may use the term "food-poisoning," unwise or excessive eating are more accurate terms. The greedy delight of a clandestine meal of fruit, and its sequel, probably form a childhood memory for many adults. Occasionally diarrhoea in a toddler is due to eating one of the popular chocolate purgative preparations which has been left within reach. The attack requires no treatment except general rest, which the child will take naturally, and alimentary rest. Only plain or glucose water should be given, in amounts determined by the extent of the diarrhoea. There is no place for purgatives. Indeed, such an occasion as this provides an opportunity to warn the parents against purgation in any future episode of abdominal pain and vomiting. In this way perforation in acute appendicitis may be prevented. Should the present episode be the latest of many in a greedy obese child, the occasion may also provide the opportunity for advice to the mother on dieting, which must of course be followed up later.

Food-poisoning

When several members of the family, school, or other group are simultaneously afflicted with diarrhoea, abdominal pain, and vomiting, food-poisoning will be suspected. If the incident appears to be more than trivial any suspicious items of food should be sent to the public health laboratory, and the medical officer of health notified. Treatment as for a dietary indiscretion is often sufficient, but occasionally the child may become significantly dehydrated and require hospital admission for intravenous resuscitation.

Infantile Gastro-enteritis

Though less common and less serious than it used to be, infantile gastro-enteritis is still a potentially fatal condition. It is extremely infectious to other infants, and the infecting

organism is usually one of the specific serotypes of *Escherichia coli*. The disease rarely, if ever, occurs in exclusively breast-fed infants; apparent diarrhoea in such infants, especially in the first six weeks of life, is physiological and requires no treatment, though it is wise to inquire if the mother is taking purgatives, as some of these—for example, cascara and phenolphthalein—are secreted in milk.

Either vomiting or diarrhoea may be the first symptom of infective gastro-enteritis, but, whichever it is, the other usually follows rapidly. The stools become frequent, watery, green, and explosive. In the worst cases moderately severe dehydration becomes clinically manifest within a few hours and hospital admission becomes urgent. The biochemical and nursing problems and the sheer technique of intravenous therapy can be extremely difficult, so it is important that the infant is admitted to a hospital which has the necessary expertise as well as facilities for isolation. The features of moderate dehydration are restlessness, sunken eyes, dry skin with loss of elasticity—if a fold of skin is pinched up between finger and thumb it will not disappear instantaneously when released, as it will in the normal child—dry red lips and tongue contrasting with the pale face, depressed fontanelle, rapid pulse, and scanty dark urine. A baby in this state has lost about 5% of his body weight. In severe dehydration, equivalent to about 8 to 10% loss, the infant is apathetic, the skin cold and mottled, the fontanelle severely depressed, and the skull sutures over-riding, and the need for urgent rehydration is obvious. Yet infants still arrive at hospital severely dehydrated, an indication of the rapidity with which deterioration can occur at this age.

If none of the above signs of dehydration except sunken eyes is present the infant is only mildly dehydrated. As long as no deterioration occurs and oral fluids are retained he may be nursed at home, but the sensible mother should be informed of the signs which indicate deterioration.

The aims of treatment are: (1) to maintain hydration and correct dehydration; (2) to rest the alimentary tract as much as possible; (3) to treat the infection. The first two aims may best be achieved by withholding all milk and solid foods, giving instead 5% sugar in one-fifth normal saline orally in adequate quantities. The mother should add five heaped teaspoons of glucose, or five level teaspoons of sucrose, and two saltspoons of salt¹ to one pint (584 ml.) of boiled water; this solution is given at least three-hourly by bottle or spoon, a total of 3 oz./lb. of body weight being given daily. If watery diarrhoea continues the amount of oral fluid should be increased. However, after 12 to 24 hours on this regimen the stools usually become smaller and less frequent, and after 24 to 36 hours a weak milk mixture may be substituted for glucose water. Half-cream national dried milk or an equivalent, or half-cream evaporated milk (Regal), should be made up as a quarter-strength or half-strength feed and offered three-hourly or four-hourly in quantities calculated

¹ Tablets of sodium and potassium chloride are made by British Drug Houses. Instead of the salt, four of these tablets may be added to one pint of water.

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to give 3 oz./lb. (187 ml./kg.) of body weight daily. After another 24 hours a three-quarter strength feed is given, to be followed on the next day by a full-strength feed. This step-wise increase of the strength of the feed may be temporarily stopped at any stage if diarrhoea returns, and the practitioner should be prepared to send the child to hospital at any stage if the general condition deteriorates.

The third aim is of less immediate importance than the other two. Even an appropriate antibiotic has little effect on symptoms without alimentary rest, and it cannot compensate for dehydration. The organism is usually sensitive to neomycin and tetracycline, so one or other drug should be given six-hourly orally for at least five days (neomycin 25 mg./lb. (55 mg./kg.)/day; tetracycline 10 mg./lb. (22 mg./kg.)/day). It is advisable if possible to send a stool specimen to the bacteriological laboratory before antibiotics are started, though treatment need not, of course, wait on the result.

Some patients lose more water than salt in the stools, some are given insufficient water by mouth, and some are given too much salt in the oral glucose mixture. Such infants may develop the condition called hypertonic dehydration. This may be difficult to diagnose and can have serious sequelae. The infant shows cerebral irritability and stupor, the skin has a doughy feel, while the orthodox signs of dehydration are often absent. Such an infant is at risk of developing subdural haemorrhage and brain damage. Prevention is therefore all-important.

Dysentery

Infection with *Shigella sonnei* or *flexneri* usually occurs in pre-school and schoolchildren rather than infants. Though the child is febrile and has diarrhoea (typically bloody), dehydration is not usually severe enough to require intravenous therapy. Hospital admission may be required because of difficulty in isolation at home, but with a sensible mother and reasonable home conditions the child can often be treated at home. A stool from each member of the family should be sent to the bacteriological laboratory, and all those with positive stools should be treated with oral streptomycin (20 mg./lb. (44 mg./kg.)/day in four divided doses), sulphadimidine (100 mg./lb. (220 mg./kg.)/day), or ampicillin (Penbritin) (62.5 or 125 mg. six-hourly). If the *in vitro* sensitivity of the organism is unknown a combination of streptomycin and sulphonamide (for example, Guanimycin) or colistin (Colomycin) (70,000 units/lb. (150,000 units/kg.)/day) may be used.

Salmonella Infection

Children with this infection are usually ill enough to require hospital admission. For those whose condition is mild enough to be treated at home ampicillin or colistin are likely to be effective, but it is wise to act on the results of *in vitro* sensitivity tests of the organism grown from the stool.

Chronic Diarrhoea

Chronic Constipation

An important initial step in a case of chronic diarrhoea, particularly if faecal incontinence is also present, is to ensure that the case is not one of spurious diarrhoea with chronic constipation. In such a patient abdominal palpation reveals faecal masses in the descending colon and in the suprapubic region, and on rectal examination hard faecal masses are felt completely filling the rectum. Fluid faeces leak past these masses and through the dilated and insensitive anal sphincter, so that faecal incontinence results. Treatment consists initially

of enemata and manual evacuation until the rectum is empty, together with an aperient such as Sennakot or Dulcolax (bisacodyl). The dose of bisacodyl is one tablet daily for a child over the age of 3 years. It is not recommended for children under this age. Later, as the aperient is withdrawn, sensible bowel habits are instilled.

Intestinal Hurry

Chronic or recurrent diarrhoea is commonly a symptom of anxiety in childhood. It is particularly marked before events which are important to the child or his parents, such as examinations, school athletic events, and certain lessons. Acute attacks are of little more than nuisance value, but chronic or recurrent diarrhoea often causes anxiety in the parents, which may aggravate the symptoms of the child. Reassurance is important, but will only be effective after an unhurried history-taking and examination and probably the demonstration, by laboratory examination of the stool, that no intestinal infection or infestation is present. Though thin ("highly strung"), these children are not malnourished or anaemic.

Another type of intestinal hurry, which is probably little more than an exaggeration of the normal gastro-colic reflex, is that which follows the eating of certain foods such as fruit and vegetables; these the mother can often recognize in the child's stool. Elimination of the offending food usually brings about an improvement. Useful non-specific remedies are Kaopectate or Mist. Kaolin pro Inf. N.F.

Cow's-milk Allergy

This is probably overdiagnosed in North America and underdiagnosed in Britain. It is always worth while trying the effect of withholding all preparations of cow's milk for a few days in any infant whose diarrhoea and vomiting are of uncertain origin. If the symptoms disappear, he should be maintained on a soya-bean substitute such as Soylac or Nutramigen. The diagnosis should be confirmed by the reintroduction of cow's milk on at least one further occasion.

Malabsorption

In this group of conditions a defect of digestion or absorption, usually congenital, leads to increased bulkiness of the stools, and, in the case of malabsorption of carbohydrates, to the production of frothy, irritant, acid stools by bacterial fermentation in the lower bowel. As a result of malabsorption these children are wasted and under the expected weight and height for their age. Chronic diarrhoea in a child who does not exhibit such retardation is unlikely to be an example of this group. It is usually impossible to establish the diagnosis without hospital investigation. Yet precise diagnosis is essential because the appropriate treatment will need to be continued at least for several years. These patients should therefore be investigated in hospital and discharged to the care of the family doctor when the appropriate treatment has produced an improvement. Long-term care is then his responsibility with the help of the hospital paediatrician and dietitian.

COELIAC DISEASE

This disorder is due to sensitivity to gluten, the protein moiety of wheat and rye flour. It is very rarely familial. Symptoms start in the second six months of life—that is, a few weeks or months after wheat is first ingested. The child becomes irritable, difficult with feeds, and ceases to gain weight. The appearance in an established case is characteristic: he is miserable and pale, the muscles are wasted—particularly in the upper

arms, buttocks, and thighs, where the skin hangs in folds—and the abdomen is protuberant in side view (“all in front and nothing behind”). The stools are voluminous, pale, frothy, and offensive. Such a description cannot be applied to all cases, however, and diagnosis, even with present-day laboratory tests, can be very difficult. When the diagnosis is established a gluten-free diet is started. Though there are difficulties in maintaining this, particularly in a large family or on social occasions, the results of the diet are usually so dramatic that the parents require little persuasion to maintain it. The basis of the diet is the exclusion of all wheat and rye protein. As gluten is responsible for the binding properties of bread and cake it is difficult to make palatable bread without it in the home. However, in most areas arrangements can be made with a local baker for a supply of gluten-free bread and biscuits, which are now made by several wholesale bakers. A cook of even moderate ability can make acceptable gluten-free cake and biscuits. Gluten-free flour may be prescribed on E.C.10. Gluten is found in foods that one might not suspect—for instance, malted milks, certain ice-creams and ice-cream cones, macaroni, certain sauces, and chocolates and sweets with fillings. Reference to the dietitian should therefore be made before any new substance is introduced into the diet. A comprehensive list of gluten-free foods has been published (Fletcher and McCrlich, 1958).

Is a strict diet always necessary? In most cases it is. Even if diarrhoea does not prove troublesome, the presence of a small amount of gluten in the diet may cause a reduction in the rate of linear growth. Long-term measurement of height and weight provides one of the best methods of assessing the strictness of the diet.

For how long should the diet be maintained? There is good evidence that reintroduction of gluten even after several years of good health is commonly associated with a recurrence of symptoms or a decrease in growth velocity. It is therefore considered wise to maintain a strict gluten-free diet at least until after puberty, by which time the prepubertal growth spurt and sexual maturation will have taken place.

FIBROCYSTIC DISEASE OF PANCREAS

This pluriglandular disease produces its most serious effects on the lungs, but in this paper we are concerned only with the defects in the pancreas and glands of the small intestine. Because of the absence of proteolytic and lipolytic enzymes digestion of protein and fat is defective and malabsorption consequently occurs. Steatorrhoea is gross, and the stools have an extremely pungent odour which has been likened to rancid butter. The mother may know when the child has passed a stool by the smell she meets on entering the house. They are also bulky, loose, and pale, as in coeliac disease. The child is wasted and underweight, usually with a chronic cough and acute attacks of respiratory infection. On questioning the mother may agree that the child tastes salty when she kisses him.

Diagnosis will require hospital investigation, the most certain test depending on this last feature—that is, excess salt in the sweat. Treatment of the absorption defect consists of the administration of a high-protein, low-fat diet, and pancreatin powder. For infants the powder is poured into the milk feed when warm. For older children it is sprinkled on to the food when warm or cold, or poured into a glass of warm milk which

is drunk during the meal. If the food or milk is too hot the enzyme activity is destroyed. Pancreatin *B.P.* should be given in the dose range 0.3 to 1 g./kg. body weight/day in divided doses. Alternatively, and for preference in infants, Pancrux V, which is five times stronger than pancreatin *B.P.* may be given (50 to 200 mg./kg. body weight/day). The dose of either preparation should be increased until the stools are in appearance and odour as near normal as possible. A water-soluble multivitamin preparation such as Abidec drops (0.6 to 1.2 ml. daily) should also be given.

DISACCHARIDASE DEFICIENCY

Recently several familial conditions have been described in which malabsorption of disaccharides occurs. Because of an enzyme defect the patient is unable to convert the sugar to monosaccharides, in which form absorption normally takes place. Alactasia, a condition in which lactose cannot be converted to glucose and galactose, is a good example. The patient suffers from frothy, sour stools, excoriation of the buttocks, and general wasting from a few weeks of age. A change from milk to a glucose feed produces an obvious improvement. The diagnosis is proved by showing the absence of a rise in blood sugar after a lactose feed, though an equivalent amount of glucose and galactose produces a normal rise. Treatment consists of the substitution of a lactose-free milk, such as Low Lactose Milk or Nutramigen, for cow's or human milk. This must be continued for several years, perhaps for life.

Giardiasis

Though infestation of the alimentary tract with *Giardia lamblia* often produces no symptoms, there are occasional children whose chronic diarrhoea is due to this parasite. Mepacrine 300 mg. daily for five days is effective. Flagyl (metronidazole) 375 mg. daily for five to seven days has been reported to give good results.

Ulcerative Colitis

Though rare in childhood, this disease is becoming commoner in some countries with a high standard of living. The stools contain blood and pus but no pathogens. Continuing diarrhoea with general wasting, malaise, and fever provides the common presentation. Hospital admission will be required to establish the diagnosis and demonstrate an initial improvement. After discharge home treatment may consist of oral steroids, prednisolone phosphate enemata, and perhaps oral Salazopyrin (sulphasalazine). A point of equal importance: the family doctor's advice and support will be needed often through the years of childhood and adolescence and perhaps into adult life.

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REFERENCE

Fletcher, R. F., and McCrlich, M. Y. (1958). *Brit. med. J.*, 2, 299.