Managing Gastro enteritis at home

by Dr Russell Marivate

Gastroenteritis is a clinical syndrome of diarrhoea and/or vomiting of acute onset, often accompanied by fever and constitutional disturbance.

Diarrhoea is a condition of a patient who has more than one watery stool in a day. Some programmes define diarrhoea as two or three watery stools per day.

Pathogenesis

Diarrhoea occurs when fluid and electrolyte movement within the GI tract is disturbed in at least one of the following ways: increased secretion of fluid — secretory; inhibited absorption of fluid — osmotic diarrhoea; motility disturbance in either the small or large bowel — motility related diarrhoea.

Secretory Diarrhoea — diarrhoea is caused by activation of cAMP: *(See Fig. 1)*. Intestinal absorption remains normal, and diarrhoea results because the sheer volume of secreted fluid exceeds the normal absorptive capacity of both small intestine and colon.

Other bacterial strains cause acute diarrhoea by damaging the colonic mucosa causing outpouring of serum proteins, blood, and mucus, and possibly decrease in colonic fluid absorption as well. Some parasitic invasion of the colon has the same result.

Other substances may cause this type of diarrhoea, namely metabolites of bile salts; dietary fatty acids when these are converted into hydroxy acids.

Osmotic diarrhoea — molecules of unabsorbed osmotically active substances in the lumen of the GIT attract water into the lumen. Diarrhoea ensues when excess water exceeds the normal absorptive capacity of the colon. *(See Fig. 2 overleaf)*.

There is interaction between bowel contents and aborptive cells. Gut activity that is too slow fosters intestinal stasis and bacterial overgrowth, which in turn activates cyclic AMP secretion. When gut movement is too fast, bowel contents are insufficiently exposed to absorptive cells, and thus absorption is impaired.

Common causes of acute diarrhoea

Viruses:— Rotavirus is by far the most important viral cause of infant gastroenteritis. It infects and damages mucosa of the small intestine. No other virus (adenovirus, astrovirus, calicivirus, and coranavirus, measles, echovirus, and coxsackievirus) approaches rotavirus in importance.

Bacterial — These are shigella strains; salmonellae; E coli (enteropathogenic); campylobacter — which has the highest incidence in older children.

The toxigenic (non-invasive) bacteria are E coli (enterotoxigenic); V cholera; S aureus; C perfringens; Salmonella strains; V parahaemolyticus; B cereus; Sdysenteriae.

Parasitic — G lamblia; E histolytica; S mansoni.

Antibiotic-associated diarrhoea — C albicans; Staph. enterocolitis; pseudomembranous colitis.

Miscellaneous causes are food sensitivity and acute onset ulcerative colitis.

Incidence

By age two nearly all children will have had at least one episode of diarrhoea. It is estimated that in one year 500 million episodes of diarrhoea are likely to occur among babies and small children of Asia, Latin America and Africa. These will kill between five and 18 million of them.

Local conditions (Winterveld) illustrate that during the months of November and December 1980, out of encounters with 1641 patients, 238 suffered gastrointestinal infection. This figure of 14,5% drops only slightly for winter (228 out of 1911 patient encounters ie 11,9%) for May and June 1981.

This high incidence of infant diarrhoea is related to socio-economic conditions rather than race or climate. Poverty, poor sanitation and malnutrition appear to be the major contributory factors.

Management at home

Most diarrhoeal episodes last a short time only and clear up regardless of intervention. However, a number of these become serious and ten percent of children die from the effects of diarrhoea before reaching the fifth year of life.

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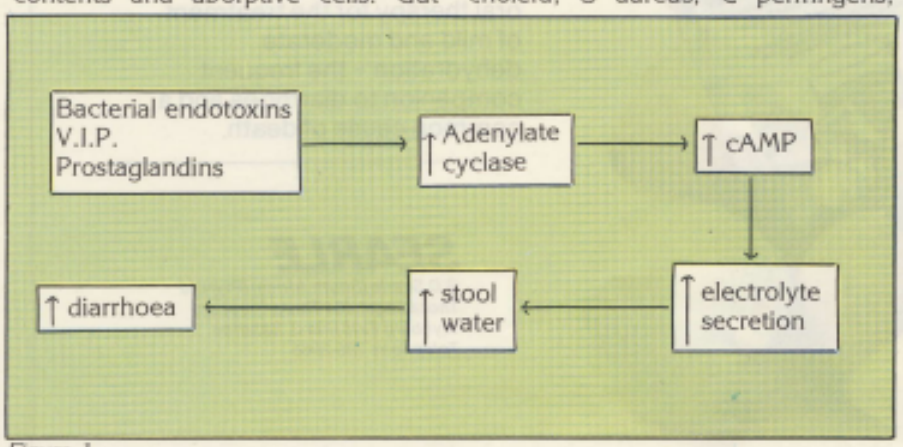


Figure 1

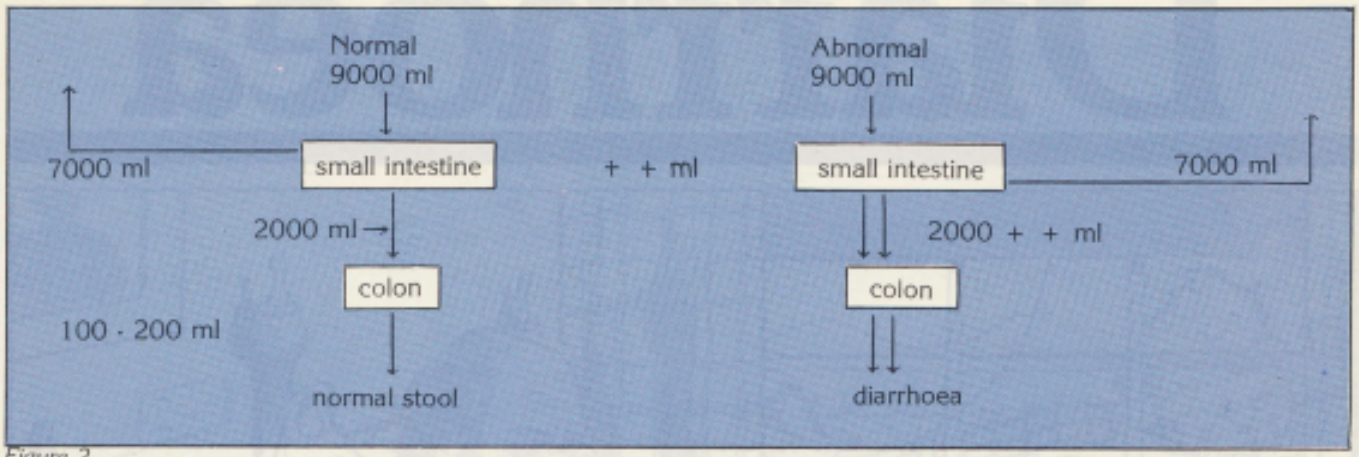


Figure 2

TABLE I

Physical sign	Degree of dehydration	Fluid loss % of body	Mortality
Irritability; thirst; pallor pink lips.	mild	2,5%	nil
sunken eyes; sunken fontanelles; dry mucous membranes; loss of skin turgor; weak and sleepy.	established	5 - 10%	2%
absent pulses; rapid deep breathing; cyanosis; drowsy, apathetic, stupor	severe	10%	50%

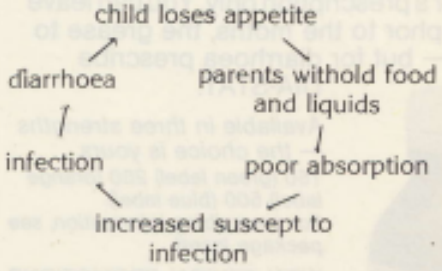
Acute mortality is due to dehydration (loss of water and electrolytes) beyond what the body can tolerate.

Patient assessment

Try and assess state of dehydration so as to determine whether to treat at home or refer to an institution. (See Table I for suggested scheme).

In the early stages of diarrhoea it is difficult to know which cases will involve significant dehydration, but ten percent of these cases will lead to dehydration, and one percent will be life-threatening. Thus every diarrhoeal case should be treated as a potentially serious illness.

Diarrhoea also impairs nutritional status through the cumulative effects of repeated episodes:



Fluid therapy

Fluid therapy is **the first and only effective treatment** of dehydration caused by diarrhoea. Fluid to be administered IV or PO. Fluid therapy does not prevent or cure the infection that may have started the process, but it counteracts the dehydration which causes death.

Oral Rehydration Therapy (ORT) has been demonstrated to be the most effective way of treating dehydration, even under the most adverse conditions imaginable.

ORT is beneficial in at least two, possibly three stages of diarrhoeal disease treatment: in **maintaining hydration** following IVT; **rehydration** is possible, making IVT not essential; may prevent dehydration (preventive potential) if started early.

Composition of ORS

The so called "complete formula" of ORS contains Sodium, potassium

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TABLE II Comparison of IV Therapy and ORT

IV Therapy	ORT
• applicable in all cases that require rehydration	• Applicable in all cases except shock severe vomiting
• preventive use not feasible	• early administration in every case of diarrhoea; if begun early, may be preventative
• requires fixed medical care facilities	• an be prepared and administered at home and in village
• supplies cumbersome to deliver to rural areas	• packets of ORS easily distributed: or even sugar and salt can be used
• administration requires well-trained personnel	• mother and family members can be instructed by minimally trained village workers
• narrow range of body tolerance for variation in fluid composition	• broader range, but care still needed
• monitoring needed to prevent overhydration	• early in diarrhoea, satisfaction of thirst usually prevents overhydration
• sterile prep and equipment needed • expensive • administration is traumatic, less easily acceptable, chance of infection	• household utensils can be used to mix • inexpensive • possible risk only in using contaminated water
• mother is largely excluded from care of child	• mother involved in care of child

chloride, bicarbonate, glucose as shown below:

sodium chloride	3,5 grams	1 level teaspoon
sodium bicarbonate (baking soda)	2,6g	¾ level teaspoon
potassium chloride	1,5g	
glucose	20g	8 level teaspoon
water	1 litre	

Expressed in mEQ as:

sodium	90 mmol/litre	(90 mEq/litre)
potassium	20 mmol/litre	(20 mEq/litre)
chloride	80 mmol/litre	(80 mEq/litre
bicarbonate	30 mmol/litre	(30 mEq/litre)
glucose	110 mmol/litre	(110 mEq/litre)
osmolality	330 mOsmol/litre	

Feeding during diarrhoea

WHO guidelines recommend continued feeding. For infants who are breast-feeding, little or no interruption of suckling is recommended. Even infants taking milk formulae should not interrupt feeding for more than eight to ten hours at the most: they should then receive dilute formulae in small quantities. Feeding should be increased during convalescence to make up for reduced nutritional intake during illness.

The reason for continued feeding during diarrhoea is basically nutritional — the net retention of nutrients by the body is greater; child recovers sooner and gains weight more easily; fasting reduces digestive enzyme activity in GIT.

Carbohydrate digestion may be impaired during diarrhoea, but lactose intolerance (due to lactase deficiency) is generally not of clinical significance and is not a contraindication for either continued breast-feeding of milk formulae in the diet. "Where clinical symptoms associated with lactose intolerance are suspected, a temporary stoppage for eight to ten hours of milk feeds and their resumption in diluted form and in small quantities may be indicated" (7).

Antibiotics and other drugs

Apart from specific invasive organisms, antimicrobial drugs should not be given for the following reasons: *Many gut infections are non bacterial; many gut pathogens are resistant to the usual drugs; anti-microbial drugs do not usually curtail illness; they prolong Salmonella carriage; they encourage R-factor - medicated drug resistance; they have unwanted effects including D & V; they add unnecessarily to the cost of treatment; they direct attention away from the all important correction of fluid loss.*

Community based programmes of ORT

In developing countries such programmes have proved very effective. Similar programmes might be effective in the less developed parts of our country.

Local attitudes and beliefs about diarrhoea play a large role in promoting acceptance of ORT. We should aim at putting across the message — DRINKING IN RESPONSE TO DIARRHOEA.

Bibliography

1. AHRTAG (1980) 2: Diarrhoea Dialogue

2. Drew W L (1981) Audio Digest Fam. Pract. 29:26

3. Goosens T, & Op de Beeck E (1981) Diarrhoea: common causes and their clinical features

4. Goossens T & Op de Beeck E (1981) Mechanisms of acute diarrhoea. Medicine Digest 6:2 17 - 21

5. Mandal B K (1981) Intestinal infections in adults and children over the age of two: International Medicine; 1:2; 56 - 61

6. Nye F J; Bell D R; (1978) Gastro-intestinal infections: Medicine SA 3rd Series 5: 175 - 6

7. Parker R L; Rinefoot W; et al (1980) WHO Population reports 8:6

8. Salus: The treatment of diarrhoea 5:2 (1981)

9. Tarlow M J: (1981) Acute infantile gastroenteritis; International Medicine 1:2 51 - 55

Bid to rationalise insulin therapy

The introduction of a single strength insulin internationally could reduce the risk of dosage measuring errors, according to Dr D R Owens who recently visited South Africa.

Dr Owens and K Villhelmson of Novo Industries Medical Department (Diabetes) reviewed the possible standardisation of insulin and insulin syringes and traced the development of insulin therapy.

"Both insulin and syringe manufacturers have responded to a clinical need which in the first 50 years of insulin therapy has saved about 25 million lives," the authors state.

They support the concept of standardised treatment using single strength insulin such as U-100 together with appropriate insulin syringes of varying capacity.

This should prevent confusion and reduce the hazard to the patient resulting from insulin dosage errors. This problem caused by the presence of U-40 and U-80 (strengths) is well known and needs to be removed," they write.

New division formed by Roussel

After 18 years in South Africa, Roussel Laboratories (Pty) Ltd are pleased to announce their new Cassenne Division.

Cassenne will operate in the field of behavioural disorders, and as part of the world-wide Roussel-Uclaf group will draw on the results of extensive research in this area; more than some 50 million dollars having been invested in Central Nervous System drugs in the past few years.

Feldene — a year in SA

Pfizer recently celebrated the first birthday in South Africa of Feldene. Being an efficient anti-rheumatic preparation in a convenient dosage form, competitively priced and with an acceptable and predictable side effect profile, Feldene has lived up to expectations and promises.