

Dialogue on Diarrhoea

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The international newsletter on the control of diarrhoeal diseases

Anti-diarrhoeal drugs unmasked

Dialogue on Diarrhoea again stresses the dangers of the unnecessary or careless use of drugs in the treatment of acute diarrhoea in children, in this third part of the series 'Drugs and diarrhoea'. This issue looks at more of the anti-diarrhoeal medicines which are widely advertised, sold over the counter and even prescribed throughout the world. These drugs are expensive, dangerous and useless; poor families spend money they cannot afford to do harm rather than good to their children. The World Health Organization has now published its review of anti-diarrhoeal drugs (see page 4 for details).

Not all drugs should be damned, however, and a future issue of the *Dialogue* will discuss the correct way to use drugs to treat diarrhoea.

Giving the right advice

In all countries more widespread education is needed about the importance of cheap and simple oral rehydration therapy (ORT) as the first remedy (and often the only remedy required) for acute diarrhoea. This crucial information must become commonplace thinking at all levels of all societies and be backed up by all health professionals, including pharmacists.

The story on page 6 shows how an ORT unit has saved money for a hospital in Lesotho — more children can be treated effectively in the out-patient department, before their illness becomes life-threatening.

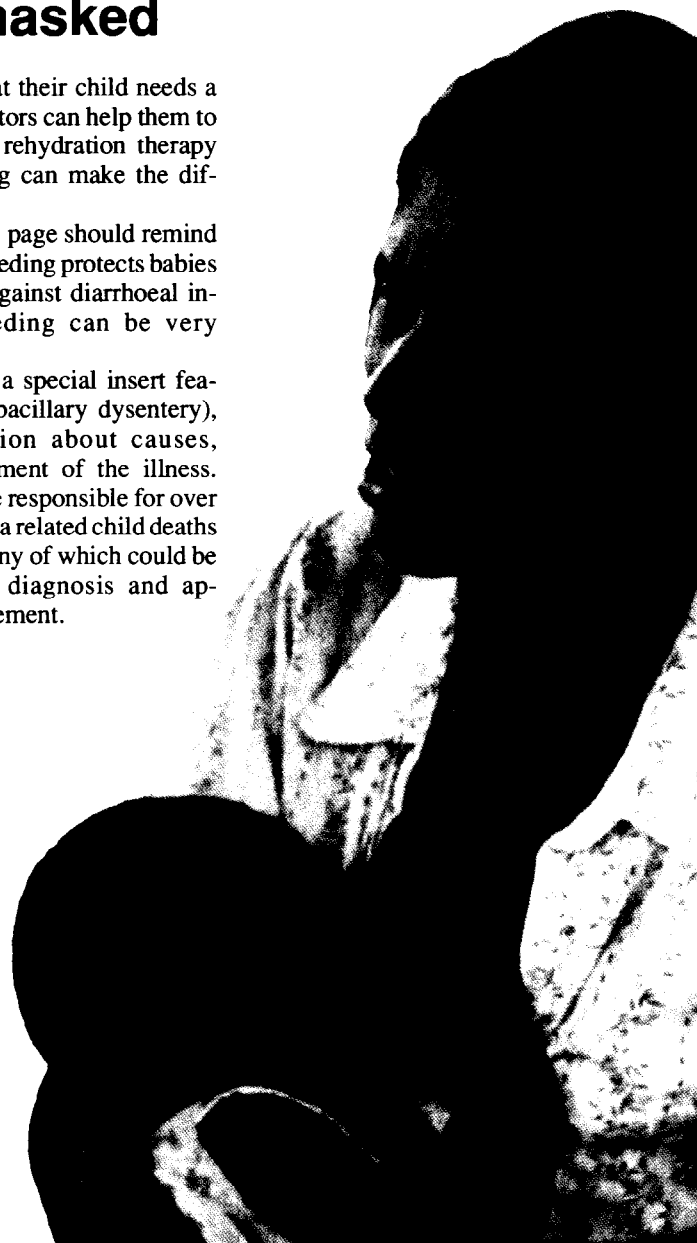
The article from Indonesia on page 5 shows that all too often doctors fail to give good advice about diarrhoea management.

Many parents feel that their child needs a drug to get better; doctors can help them to understand how oral rehydration therapy and continued feeding can make the difference.

The picture on this page should remind everyone that breastfeeding protects babies and young children against diarrhoeal infections: bottle-feeding can be very dangerous.

Also in this issue, a special insert features shigellosis (or bacillary dysentery), including information about causes, prevention and treatment of the illness. *Shigella* infections are responsible for over 25 per cent of diarrhoea related child deaths in some countries, many of which could be prevented by rapid diagnosis and appropriate case management.

Continued breastfeeding is the best 'treatment' for an infant with diarrhoea, as a reader points out in a letter on page 7. Breastmilk will help to prevent dehydration which can lead to death.



C. Stauffer/WHO

In this issue:

- Anti-diarrhoeal drugs: not recommended
- Doctors still prescribe too many drugs for diarrhoea
- ORT saves money for a hospital

AHRTAG

Appropriate Health Resources & Technologies Action Group Ltd

Adsorbents and sulphonamides

Adsorbents and sulphonamides are no longer recommended for treating acute diarrhoea. This *DD* review, the last in the series, 'Drugs and diarrhoea', explains why they are ineffective and sometimes dangerous.



Kaolin and pectin

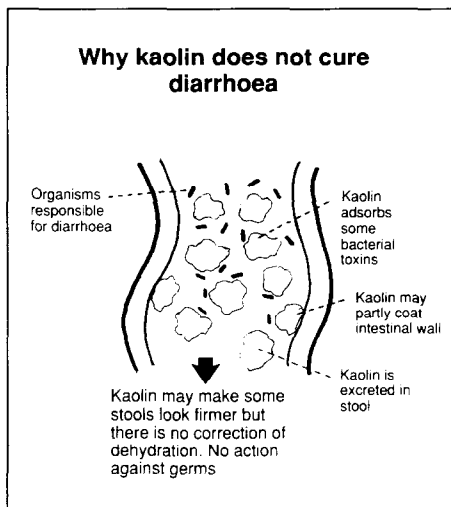
Although kaolin and/or pectin can improve stool consistency in some children with acute diarrhoea, they do not appreciably reduce diarrhoea duration, stool frequency, or stool losses. Their use may also detract from the most important treatment for diarrhoea — ORT and continued feeding. Kaolin and pectin may also stop antibiotics working properly when they are needed. Kaolin and pectin are not recommended for diarrhoea treatment. For the same reasons, other adsorbents with similar properties (such as attapulgite, smectite and activated charcoal) are also not recommended.

Formulations

Kaolin and pectin are often combined in a liquid preparation. They are marketed under a variety of brand names, and are often sold in combination with antibiotics, vitamins, or other drugs.

Pharmacology

Kaolin is a naturally occurring clay, composed of hydrated aluminium silicate. It is not absorbed when taken by mouth, and is excreted in the stool. Pectin is a car-



bohydrate isolated from the peel of citrus fruits or green apples. Polygalacturonic acid, its main constituent, is almost completely digested and absorbed in the intestine.

How they work

It has been claimed that kaolin adsorbs toxins, alters bacterial flora and can 'coat' the intestinal lining to produce a 'general protective effect'. Kaolin appears to bind cholera toxin, but not the heat-stable toxin of enterotoxigenic *E. coli*. It does not appear to have any anti-bacterial action, nor is it able to 'adsorb' bacteria.

Efficacy

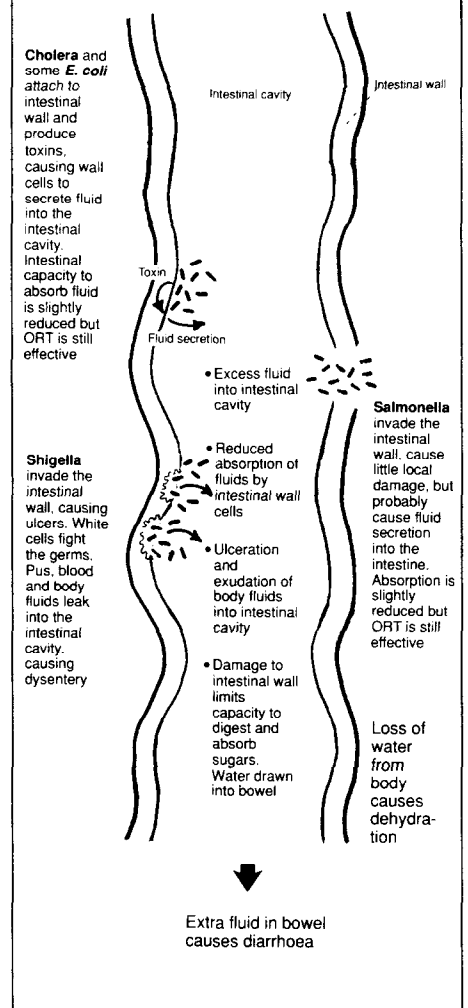
Kaolin has been used as an anti-diarrhoeal agent for hundreds of years. Pectin became popular with the use of 'apple powder diets' as a simple remedy for diarrhoea about 80 years ago.

In animal studies, kaolin-pectin has been shown to:

- decrease toxin-induced intestinal secretion in pigs when injected into the bowel at the same time as enterotoxigenic *E. coli*;
- reduce the volume of diarrhoea in dogs when given before or with cholera toxin, but not after;
- improve stool consistency in monkeys with diarrhoea caused by cholera toxin.

But in a controlled clinical trial in 1970, kaolin was ineffective in cholera treatment — with no effect on stool volume or diarrhoea duration. A study of 97 children with acute diarrhoea treated with kaolin or supportive therapy alone, showed no difference in the duration of diarrhoea, mean number of stools per day, or the clinical course of the disease. In another study, a kaolin-pectin combination given to children with acute diarrhoea resulted in more 'formed' stools, but neither of the agents alone or in combination made any difference to stool frequency or stool weight; thus the loss of water and salts in the stools was not reduced.

Some causes of diarrhoea



Adverse effects

A kaolin-pectin combination given to rats caused increased losses of sodium and potassium in the stool. Kaolin-pectin might therefore worsen electrolyte disorders in children with severe diarrhoea. Kaolin-pectin has also been shown to cause increased fat and nitrogen losses in the stool.

Drug interactions

The effectiveness of some other drugs, such as trimethoprim, chloroquine and pyremethamine, is reduced when they are given with kaolin-pectin. The interaction with trimethoprim is important for diarrhoeal diseases management because trimethoprim/sulphamethoxazole (cotrimoxazole) is widely used for the treatment of *Shigella* dysentery. Neomycin (an antibiotic which is not generally recommended) is bound by clays such as kaolin in laboratory studies. Yet a large number of currently available 'anti-diarrhoeal' compounds combine kaolin and neomycin.

Other adsorbents

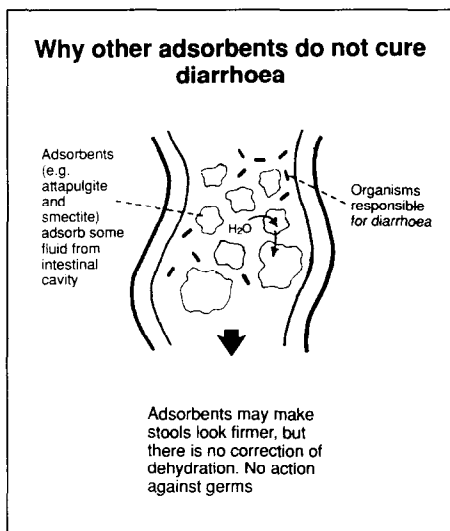
Attapulgite and smectite

Attapulgite and smectite are mineral clays, similar to kaolin in composition, which are not absorbed systemically. They are marketed as 'anti-diarrhoeal' drugs. Although they may change the appearance and consistency of the stool (by adsorbing water from the bowel cavity), there is no evidence that they reduce the loss of water and electrolytes from the bowel in acute diarrhoea. Laboratory studies comparing the capacity of attapulgite and smectite to adsorb different bacteria have shown varying results.

A number of clinical trials have evaluated smectite as an adjunct to ORS for the treatment of diarrhoea in children. However, only one controlled study has been conducted, in Egypt, where smectite or a placebo was given to 90 hospitalised children under three, in addition to ORS. It showed no difference in total diarrhoea stool output, but the duration of diarrhoea, from the time of hospital admission, was significantly reduced in the smectite-treated group (54 hours) compared with the placebo group (73 hours). Smectite appears to have little effect on stool output during the early, high purging phase of acute diarrhoea, but can alter the stool consistency and frequency as the acute attack wanes and intestinal transit time increases. This has, however, little value in the routine management of acute diarrhoea.

Activated charcoal

Adsorbent qualities of activated charcoal make it an effective antidote in the emergency treatment of poisoning and drug overdoses. Activated charcoal is a black



powder sold in tablet or powder forms, sometimes in combination with anti-motility drugs and/or antacids. It adsorbs and inactivates a number of organic and inorganic compounds by binding them in the gut. But there is no clinical evidence that it shortens diarrhoea duration or reduces the number or volume of stools. Like other adsorbents, it also binds to and makes other drugs such as tetracycline inactive, and affects digestive enzymes and intestinal micronutrients.



Sulphonamides

Non-absorbable sulphonamides (such as sulphaguanidine, succinylsulphathiazole, and phthalylsulphathiazole) were once considered the drugs of choice in the treatment of Shigella dysentery and other bacterial intestinal infections. They are still widely used in some places, even though they have been shown to be ineffective and toxic, and many bacteria have become resistant to them. There is no justification for their continued use, and their distribution and sale has been banned in several countries.

Formulations

Non-absorbable sulphonamides are marketed as a treatment for intestinal infections, particularly bacillary dysentery (i.e. shigellosis). They are either sold alone or in combination with other drugs.

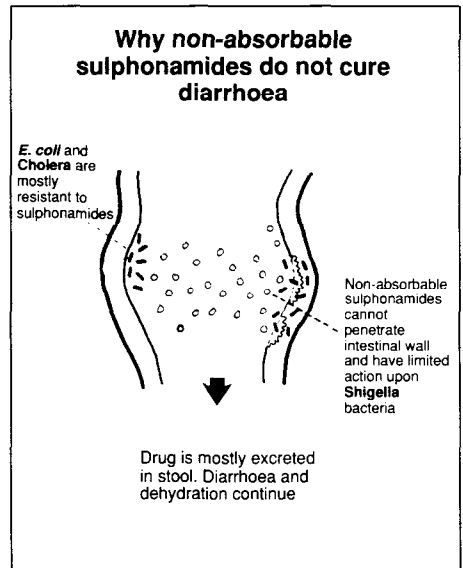
Pharmacology

All sulphonamides have the same antimicrobial spectrum; they differ only in how they are absorbed, metabolised and excreted by the body.

Non-absorbable sulphonamides work mainly in the large intestine. Absorption of sulphaguanidine by the body is slow and erratic. Fifteen to 50 per cent is systematically absorbed and excreted by the kidneys. About 5 per cent of succinylsulphathiazole and phthalylsulphathiazole is systematically absorbed. The drug is mostly excreted in the stools.

How they work

Sulphonamides stop or slow the growth of bacteria and are effective against many Gram positive and Gram negative organisms. Absorbable sulphonamides (such as sulphadimidine and sulphadiazine) have been shown to have some advantages against organisms that invade the gut wall, like Shigella, that cause dysentery. Although the bacterial count of sensitive or-



ganisms in the bowel is reduced in patients taking a non-absorbable sulphonamide, the stool never becomes sterile, and bacterial counts return to previous levels soon after the drug is discontinued.

In addition, bacterial resistance has greatly reduced the therapeutic range of the sulphonamides — and since all sulphonamides work in the same way, bacteria resistant to one are resistant to them all. Some bacteria are naturally resistant to sulphonamides; others have become resistant (see DD42). Bacteria that are sensitive to sulphonamides can become resistant during the course of treatment. Most *Shigella* strains are now resistant to sulphonamides. Resistant strains of *E. coli* and other Enterobacteriaceae are also now common, particularly in hospitals.

Efficacy

• Bacillary dysentery

Non-absorbable sulphonamides were developed as a way of getting a large concentration of the drug to the bowel, and avoiding the toxic effects of the earlier sulphonamides. In the 1940s, before modern antibiotics were available, non-absorbable sulphonamides were considered ideal for treating bacillary dysentery and other diarrhoeal illnesses. A six-year field study of non-absorbable and systemically absorbed sulphonamides used to treat bacillary dysentery in the USA reported that all sulpha drugs were effective when compared with untreated controls; but the response to the systemically absorbed sulphonamides was more rapid.

Sulphaguanidine was the first sulphonamide used to treat *Shigella* dysentery. Studies suggested it was a

Continued on next page

Drugs and diarrhoea

Continued from previous page

promising drug that brought quick clinical results, but later it was found to be less effective than the systemically absorbed sulphonamides. Succinylsulphathiazole, considered to be less toxic than sulphaguanidine, was also used to treat dysentery. However, its anti-bacterial action was found to be greatly reduced by watery diarrhoea or ulcerated intestinal mucosa. Phthalylsulphathiazole, first used in man in 1942, is similar to succinylsulphathiazole, but required a smaller dose, produced formed stools, and was effective even in the presence of watery diarrhoea.

Non-absorbable sulphonamides continued to be widely used in the 1940s and 50s. But over the years their efficacy declined markedly, due to the emergence of resistant strains of bacteria. We now know that they have limited efficacy and potential toxicity. Importation and/or production of sulphaguanidine has been banned in several countries. In the USA sulphathiazole — the active ingredient in succinylsulphathiazole and phthalylsulphathiazole — has been banned.

• Cholera

Although *Vibrio cholerae* is sensitive to sulphonamides in laboratory experiments, non-absorbable and systemically absorbed sulphonamides have been proved to be ineffective in the treatment of cholera. One controlled study of children and adults hospitalised with cholera showed no dif-



AVC Dept. St Mary's Hospital Medical School, London

Sulphonamides can cause severe allergic reactions, with peeling of skin (Stevens-Johnson syndrome).

ference in the duration of *Vibrio cholerae* excretion between those treated with sulphonamides and the control groups. Kidney problems probably contributed to the higher death rate found in the group treated with sulphonamides.

Another controlled study compared the efficacy of chloramphenicol, tetracycline and sulphaguanidine in patients with cholera. Sulphaguanidine had no significant effect on the volume of diarrhoeal stool or the duration of *Vibrio* excretion.

Adverse effects

Adverse effects of sulphonamides can affect nearly every organ system in the body. Rash and fever, such as the Stevens-Johnson syndrome, are the most common side effects. More rarely, sulphonamides affect the bone marrow and blood forming organs, the liver and kidneys. In dehydrated patients, crystals of sulphonamide can form in the kidneys and cause serious damage. Though less of the drug is absorbed, non-absorbable sulphonamides are just as toxic as systemically absorbed sulphonamides.

Destruction of the red blood cells caused by sulphonamides can lead to anaemia, and damage to the tissues which make white blood cells has also been reported. Sulphonamides can also cause jaundice if given to premature or newborn infants or to pregnant women. By altering the bowel flora, non-absorbable sulphonamides may also interfere with the bacterial production of vitamins.

Drug interactions

Sulphonamides may inhibit the effects of other drugs such as warfarin anti-coagulants, anti-diabetic sulphonylureas, and hydantoin anticonvulsants. Adjustment of the doses of these drugs may be necessary if they are given with sulphonamides.

References for the studies referred to in these reviews are available from DD/AHRTAG and CDD/WHO.

Diagrams supplied by Dr William Cutting

Drugs and diarrhoea: book review

The drugs article in this issue of *DD* concludes the series on 'Drugs and diarrhoea' (*DD*42, 43, 44). The material used for the articles has been taken from a new book, *The rational use of drugs in the management of acute diarrhoea in children*, just published by the World Health Organization.

The book provides information essential to those concerned with improving the rational use of drugs in the treatment of diarrhoea. A body of research backs up the powerful arguments against the widespread use of medicines which may harm a patient, and delay or replace effective treatment measures.

The use of anti-diarrhoeals and anti-emetics is often dangerous: critical evaluations summarise the data on commonly-used drugs of this type. The book concludes that the continued production,

promotion and sale of these preparations for paediatric practice cannot be justified.

There is a limited number of drugs which are judged to be effective, and therefore are recommended for the management of cases of diarrhoea where the cause has been diagnosed. They are summarised in a table which lists first-choice antimicrobials, followed by alternatives, for cholera, *Shigella* dysentery, amoebiasis and giardiasis.

The rational use of drugs in the management of acute diarrhoea in children. WHO, Geneva, 1990. 71pp, ISBN 92 4 156142 4. Available in English, French and Spanish from WHO outlets internationally, and WHO Distribution and Sales, 1211 Geneva 27, Switzerland. Price approx. US\$9.90 to developed countries, US\$6.95 to developing countries. Order no. 1150355.

To feed or not to feed?

DD reports on a study in Indonesia which found that although most doctors knew they should advise parents to continue feeding during diarrhoea, in practice many prescribed inappropriate treatments.

The adverse effects of acute diarrhoea include both dehydration, due to the loss of water and salts, and malnutrition, due largely to reduced intake of food. Physicians have been encouraged by WHO and national CDD programmes to motivate mothers to continue breastfeeding or giving other food to prevent malnutrition resulting from diarrhoea.

The Atma Jaya Medical Faculty research group looked at the treatment and advice given by physicians for children with acute diarrhoea in a poor and densely populated urban area of Jakarta (the capital city of Indonesia). Over 100 physicians were interviewed, and 73 of them, (who were seeing more than ten children per week), agreed to allow their clinical practices to be observed.

These physicians were working in private practices as well as in public institutions, such as government health centres or hospital out-patient clinics. Reported and observed practice on nutritional advice given to parents was analysed, as well as drugs prescribed and whether or not ORS was recommended. The study found that although physicians believe that giving

nutritional advice is part of good medical practice in treating children with acute diarrhoea, they do not always offer nutritional advice to parents in their clinical work (see Table).

Differences in practice and belief

Only 7 per cent of physicians interviewed said they recommended 'resting the gut' in treatment for acute childhood diarrhoea, and in only five of the 186 observed cases was such treatment recommended. There was, however, a significant difference between belief and practice related to giving nutritional advice and other treatments. In public health centres and private practices, over 85 per cent of physicians said they gave nutritional advice to parents; and 92 per cent said they believed that breastfeeding should be encouraged when a child has diarrhoea. Yet, observation found that in only 53 per cent of the 186 cases did physicians recommend any nutritional action, either continuing breastfeeding or giving other foods.

What explains the difference between what physicians believe to be appropriate practice and what they actually do in their

Prescribing practices of 73 doctors in the treatment of diarrhoea

Treatment	Public	Private	Total
Nutritional advice	41%	67%	99 cases
Antibiotics	94%	86%	106 cases
Spasmolytics (spasm relieving drugs)	31%	30%	61 cases
Adsorbents	14%	25%	39 cases
ORS	59%	38%	87 cases

clinical work? There was a significant difference between doctors in public and private practice. It is possible that physicians have more time to give nutritional advice in their private practices than in public health centres.

Prescribing medicines

The table also shows that physicians in both public and private practice prescribed some form of medication, especially antibiotics, for a high proportion of cases, and that medication was recommended more often than ORS. However, doctors in the public sector prescribed ORS in many more cases, due possibly to effective government information and training programmes. Physicians in private practice may feel more obliged to meet parental expectations for a medicine that would help their children to recover rapidly. This, and the tendency to focus on concerns about disease pathology (the organism causing the diarrhoea) in both sectors, may lead to an emphasis on medication rather than on nutritional advice. Nutritional advice was given less frequently than antibiotics.

These findings emphasise the continuing need to educate physicians about the appropriate use of antibiotics and ORS, and the importance of giving correct nutritional advice for children with acute diarrhoea.

Herawati Arif and Lusiana Gani, Department of Public Health, Atma Jaya Medical Faculty, Jendral Sudirman 51, Jakarta, Indonesia.

With support from ADDR.



Doctors should give parents advice about continued feeding/giving fluids to a child with diarrhoea, as well as information about ORT.

Is oral rehydration therapy cost effective?

Although diarrhoeal disease control (CDD) programmes are widely perceived to be cost effective, there is little documented evidence to support this. Those studies which do show the cost effectiveness of CDD programmes need to be made more widely available to strengthen the case for funding such programmes. This study describes the economic benefits of establishing an Oral Rehydration Therapy Unit (ORTU) in a major hospital in Lesotho. The ORTU was set up in February 1986 at the Queen Elizabeth II (QEII) Hospital in Maseru. It provides case management for children presenting with diarrhoea to the out-patient department; over 4,000 children under five years of age were treated during the first two years. To evaluate the ORTU, a study compared the cost of treating diarrhoeal disease at the hospital one year before the establishment of the ORTU (1985) and one year after it was set up (1987).

Treatment costs reduced

The cost per child under five years for treatment of diarrhoea was (including in-patients and out-patients) 38 per cent less in 1987 than in 1985. Most of the saving came from treating a greater proportion of diarrhoea cases as out-patients, rather than as in-patients. In 1985, 12 per cent of children under five with diarrhoea were treated as in-patients, compared with only 6 per cent in 1987.

The difference in cost between out-patient and in-patient treatment reflects a decrease by half in the average cost of drugs and supplies for out-patient diar-

Figure 1: Number of diarrhoea admissions to paediatric ward, QEII Hospital, Maseru, Lesotho, 1985 and 1987

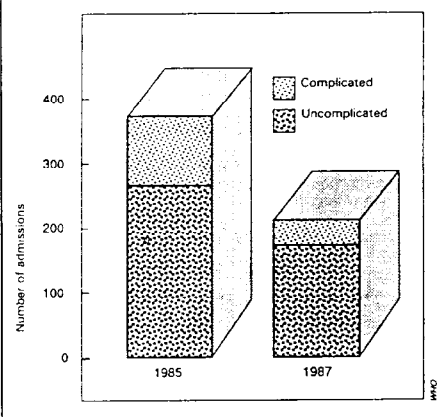


Figure 2: ORTU savings in the first three years of operation (1985-87)

	M (Maloti) ¹
Total ORTU savings (from reduced admissions)	36,166
Total ORTU costs	
• Set-up costs : 8,000	
• Running costs : 2,270	10,270 ²
Net saving	25,896

¹ The local currency unit. In 1987, US\$1.00 = M2.4.

² Does not include costs of personnel already accounted for in hospital budget for training of ORTU staff.

rhoea treatment. Before the establishment of the ORTU, children with diarrhoea were more likely to be treated with antibiotics than with less expensive ORS. After the ORTU was established, they were likely to be given antibiotics in addition to ORS only if admitted for treatment when the ORTU was closed. Most (67 per cent) children with diarrhoea were treated in the ORTU with ORS only.

Hospital admissions down

The number of diarrhoea related admissions to the paediatric ward decreased from 376 in 1985 to 218 in 1987 as shown in Figure 1. Admissions were split into 'complicated' and 'uncomplicated' categories. 'Uncomplicated' admissions were those for which diarrhoea or gastroenteritis was the only diagnosis.

Children with diarrhoea plus another diagnosis were classified as 'complicated' admissions; these made up about one fifth of total admissions. The cost per 'uncomplicated' admission was lower in 1987 than in 1985. The decrease was mainly due to a reduction in the average length of stay from 5.7 days to 3.4 days, but also to a decrease in the average cost of drugs per patient.

Costs per 'complicated' admission more than doubled between 1985 and 1987, but the reduction in the number of such admissions led to an overall saving. On balance, the reduction in admissions to the hospital, due to the work of the ORTU, led to total savings of over US\$15,000 (at 1987 exchange rates).

The overall cost for treating diarrhoea cases in under fives was 1.3 per cent of the total hospital expenditure in 1985, but only 0.57 per cent in 1987.

Conclusion

Comparison of expenditure on establishing and running the ORTU for one year with the savings due to the decrease in admissions shows a substantial net gain to the hospital, and hence the cost effectiveness of the ORTU (Figure 2). This saving should be even greater in subsequent years because set-up costs will not be required. This study shows the usefulness of applying cost effectiveness techniques; in Lesotho they have highlighted the contribution made by the CDD programme through appropriate case management.

Diarrhoeal Diseases Control Programme, WHO, Lesotho. Weekly Epid. Record No 36: Sept. 1990.

Cereal based ORT: pros and cons

Sucrose based oral rehydration therapy (ORT) for diarrhoea is promoted in many countries. The Bangladesh Rural Advancement Committee (BRAC) programme has taught more than 13 million mothers about a home based sugar-salt solution (SSS), and achieved very high levels of knowledge about ORT and correct mixing. However, these women have subsequently used SSS in only 20 per cent of all diarrhoea episodes.

Mothers often complain that SSS does not stop diarrhoea. Since recent research has shown that a rice based solution may decrease fluid losses, a BRAC study tested its acceptability and use compared with SSS. Rice is more available in rural homes (95 per cent) than all kinds of sugar (less than 30 per cent) and rice gruel is a widely accepted food during illness.

A field trial was conducted in early 1987 in three areas (total population 68,345). Mothers were taught to make both types of solution through initial and follow-up house-to-house visits by BRAC health trainers. Further follow-up visits (to a 5 per cent random sample) were made at three monthly intervals for one year, to assess knowledge and analyse the content of the solutions prepared. Focus group discussions were also held with small groups of mothers to find out their opinions about the two types of ORT fluids.

Although mothers unanimously recommended the rice based solution, because they thought that this 'stopped' the diarrhoea more quickly, they used SSS twice as often (in 40 per cent of severe watery episodes) as the rice based solution (18 per cent of severe watery episodes). They found rice based solution more time consuming and difficult to prepare. There was

no significant difference in the proportion of the two solutions prepared with a safe composition. Children also preferred the sweeter taste of the sugar-salt solution. In addition, there are cultural barriers to giving 'solids' to children aged less than six months old, as mothers believe that young infants cannot digest them, and rice is considered a solid. In some areas lack of firewood is also a problem, preventing mothers from preparing the rice based solution.

In conclusion, convenience factors seemed to outweigh maternal preference when it came to choosing the type of solution to use. These factors led to lower use rates of the home-made rice based fluid, making it a poor substitute for SSS at community level in rural Bangladesh.

Chowdhury, A, et al., 1990. Home made oral rehydration therapy: a community trial comparing the acceptability of sucrose and cereal based solutions. BRAC, 66 Mohakhali Commercial Area, Dhaka 1212, Bangladesh.

Local distribution of DD

DD in English is free to readers in developing countries from the address in the UK on the back page. But did you know that you can get DD in other countries as well? The following organisations will be able to send you free copies in the language indicated:

Bangla: BRAC, 66 Mohakhali C A, Dhaka-12, Bangladesh; and Child in Need Institute (CINI), P O Box 16742, Calcutta 700072, West Bengal, India

Chinese: Paediatric Section, Foreign Medicine Editorial Dept., China Medical University, 3rd Affiliated Hospital, No. 6, Section 1, Sanhao St, Shenyang, Liaoning, P R China

French: ORANA, B P 2089, Dakar, Senegal

Nepali: HLMP, Institute of Medicine, Tribhuvan University, P O Box 2533, Kathmandu, Nepal

Portuguese (in Mozambique and Angola only): Ricardo Barradas and Ana Novoa, Faculdade de Medicina, Universidade E Mondlane, C P 257, Maputo, Mozambique

Spanish: Grupo CID, P O Box 39256, Washington DC 20016, USA

Tamil: RUHSA, Christian Medical College and Hospital, RUHSA Campus, PO 632209, North Arcot District, Tamil Nadu, India

English editions are also available in country from:

India: CMAI, Plot 2, A-3 Local Shopping Centre, Janakpuri, New Delhi 110058

Pakistan: Imajics (Pvt Ltd), F-25/A, Block 9, Clifton, Karachi

Appropriate drug marketing

MaLAM (the Medical Lobby for Appropriate Marketing) is an international group of health workers promoting rational use through campaigning for improved drug marketing. The group also provides information on medicine marketing through its monthly newsletter.

Peter Mansfield, MaLAM, 22 Renaissance Arc, Adelaide, SA 5000, Australia.

Is industrial salt safe for ORT?

In Nigeria recently there has been a great scarcity of many household goods, including salt. Industrial salt from factories was the only salt available for cooking, giving a very salty taste to food, even when very little was used.

What amount of industrial salt should be used to make sugar-salt solution for ORT? Is it different from ordinary salt, and is it dangerous?

Ariyo Olusegun Raphael, P O Box 420, Ilorin, Kwara State, Nigeria.

Hans Faust of WHO replies:

Provided that the industrial salt mentioned is sodium chloride, it can be assumed that it is more purified and cleaner than the usual household salt; it may also be fortified with fluoride or iodine. This may explain why the taste seems stronger than that of household salt. The amount of industrial salt to use is the same as for other types of salt — 3 grams per litre of water. However, the volume of salt required to make 3 grams varies according to the size of the crystals. Fine crystals pack more closely and require a smaller volume; large crystals do not pack as closely and need a larger volume. For this reason it should be determined whether one level teaspoonful (using a local standard teaspoon) of industrial salt weighs about 3 grams. If the weight is much more than this, i.e. 4.5 grams or more, another means of measuring the salt should be sought.

Ethiopia: local beliefs about nutrition

In DD41, I was interested to read the letter about local beliefs and diarrhoea. I work as a nutritionist in Western Ethiopia, and have been collecting information about local beliefs. Many people do not know what causes diarrhoea, although some know that dirty water or the ascaris worm can be the reason.



Asem Ansari/ICDDR,B

Household or industrial salt can be safely used for making sugar-salt solution.

However people also believe that the following can cause diarrhoea: teething in small children; a bad fall; eating 'germinated flour'. During diarrhoea, people commonly believe that food and drink should not be given, in order to 'dry out' the diarrhoea. Many feel that if the person wants to drink more, he or she will soon die. Local foods recommended for 'curing' diarrhoea include dry bread mixed with soot; honey mixed with instant coffee powder; roasted niger seed — none of which is appropriate.

Many of these local beliefs are very dangerous, and we are designing teaching aids and handouts to try to discourage them and encourage good practice.

Veronika Scherbaum, Nejo Clinic, EECMY, Nejo, Wollega Province, Ethiopia.

Value of breastfeeding during diarrhoea

We still need to correct the wrong impressions some mothers have that breastmilk worsens diarrhoea. Breastfeeding is the best food during diarrhoea. Apart from helping to prevent dehydration, breastfeeding is beneficial during and after diarrhoea. Constant breastfeeding during diarrhoea shortens its duration. It also reduces nutritional losses which usually accompany diarrhoea. The consumption of breastmilk during diarrhoea is maintained while that of other foods is often reduced. Infants often continue with breastmilk while refusing other foods, especially non-human milk, during diarrhoea.

Adewole Atanda, Environmental Health Officer, Oyo Local Government, PMB 1008, Oyo, Nigeria.

ORS — given too late in diarrhoea treatment

It is unfortunate to note that many families view sugar-salt solution (SSS) and ORS solution as 'medicine' and so give them too late, as mentioned in *DD41*. I assume that this is one of the results of social marketing programmes used to promote ORS, especially when ORS is sold in pharmacies and mothers know that only drugs or medicines are sold there. With education which emphasises not using drugs unnecessarily, no mother likes to apply a 'drug' to a case of diarrhoea until it has progressed to a severe stage. This is what I have found in interviews with some mothers attending our MCH centres.

I suggest that programmes marketing and distributing ORS should be reviewed to take account of these issues.

Anthony E Koomson, Nutritionist, ADRA, P O Box 1435, Accra, Ghana.

More ideas for nutritious weaning foods

In *DD40* weaning foods were discussed. I would like to describe the type of weaning food used here. Our Community Health Post is in the rural area around Ilorin and the weaning food developed and taught by community health workers to mothers is called 'soya-ogi'. This contains soy beans and porridge (of maize or guinea corn). This mixture, apart from being readily available, is also cheap. Mothers are encouraged to include processed soy bean in their children's porridge (porridge being the usual weaning diet). It ensures that much-needed protein is present in the diet of the child, thus helping to reduce death from malnutrition.

The soy beans are processed by boiling them in water for 15 to 20 minutes, to soften the coat and allow its easy removal. After removing the coat, they are boiled again for another 30 minutes to remove the unpleasant smell usually associated with soy beans. After drying in the sun, the beans

are slightly roasted and turned into powder (flour) by grinding or milling. This flour can be stored in a clean, dry, closed container. The preparation can be kept for up to three months without spoiling.

The 'soya-ogi' is prepared by boiling three cupfuls of water in a pot with one teaspoonful of palm oil added. Two heaped teaspoonsful of the processed soy bean flour are added next and the mixture is boiled again before adding ogi (fermented maize or guinea corn porridge) to make a thick mixture. Sugar is added last to taste. Mothers are encouraged to give the meal with a cup and spoon and advised to discard any left over after 24 hours.

Apart from its use as a weaning food, it is also given during diarrhoea in addition to SSS, which is used commonly here.

Salami Taofik, Faculty of Health Sciences, University of Ilorin, Ilorin, Kwara State, Nigeria.

A cautionary tale: dysentery

Recently my daughter, aged 17, had severe vomiting, diarrhoea and a fever. The doctor told her to stop eating altogether and drink nothing but Coca-Cola. "You must rest the gut," he said, "and don't feed the germs." She got very hungry and even weaker. She couldn't drink a lot of Coca-Cola — it was too sweet.

The diarrhoea stopped after two days so it was difficult to provide a stool sample for analysis. Eventually she produced a few drops of bloody mucus. A week after first seeing the doctor a diagnosis was made — shigellosis (caught in Romania). She was still suffering from intermittent fever, was by now very weak and had lost nearly eight kilos. She was prescribed a course of antibiotics.

Was the doctor correct in saying "Don't eat — starve the germs"? Would there be more or less bleeding and inflammation if food were eaten?

Janie Hampton, 118 Hurst Street, Oxford, UK.

Dr William Cutting replies:

Janie Hampton's story of her daughter's diarrhoea is salutary. The fact that her daughter had both fever and blood in her stools should have alerted the doctor to the fact that this was not simple diarrhoea but dysentery.

- Drinks are the right way to treat virtually all cases of diarrhoea, but the sort of drink is important. Coca-Cola is mostly sugar in water and contains very few salts which are most important. The sweetness even put Janie's daughter off the most important aspect of the treatment, drinking.
- Food is an important part of the treatment. "Rest the bowel" is an old fashioned idea. It is now known that recovery is faster if, once the fluid has been replaced, food is taken by mouth, as the nourishment of the cells of the lining of the bowel depend on this. Starving will just cause additional harm to the bowel, and the patient will lose weight.
- Antibiotic drugs have a definite but limited place in the treatment of diarrhoea. Janie's daughter had specific indications for an antibiotic — dysentery stools containing blood, and fever, suggesting that she had germs that were invading and damaging the bowel wall. Appropriate treatment could have been with ampicillin or cotrimoxazole.

Even in a home with modern water supply and hygiene facilities, diarrhoea is contagious and extra precautions should be taken to avoid other members of the family getting the disease. These are mainly simple things like handwashing after using the toilet, after handling soiled nappies and clothes, and especially before preparing and eating food. Shigella dysentery is particularly contagious, as only a few germs are needed to cause the infection. (See insert on Shigella in this issue.)

Next issue: *DD45* will cover diarrhoeal problems in refugee camps and cholera.

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