

# Dialogue on Diarrhoea



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The international newsletter on the control of diarrhoeal diseases

## Drugs and bloody diarrhoea

Oral rehydration therapy (ORT) is the simplest and most important advance in the treatment of dehydration due to diarrhoea. Dehydration probably accounts for at least 60 per cent of deaths from acute watery diarrhoea. Unfortunately there are other diarrhoeal causes of death which are not so simple to treat. In this issue we focus on dysentery – and the role of drugs, in addition to ORT, in the treatment of diarrhoeal disease.

### Dysentery: a major problem

Dysentery is diarrhoea with blood and pus in the stools. There are two main types; that due to bacteria, bacillary dysentery, and that due to parasites, amoebic dysentery. In recent years several major epidemics of bacillary dysentery caused by shigella organisms have occurred, associated with high death rates (see page 4). Although dehydration was present in many of those who died, it was probably not the main cause of death. Antibiotic drugs can be valuable in treating dysentery and this is discussed on page five of this issue. Amoebic dysentery is more difficult to diagnose. Many people who live in conditions where environmental hygiene is poor may have this parasite in their bowels, but relatively few show obvious clinical signs of dysentery. It is now known that only certain types of amoeba cause illness in man.

### Simple diagnosis

Can dysentery be diagnosed without access to a microbiological laboratory?

In fresh stools, blood can be seen by the naked eye in over 50 per cent of cases of shigella dysentery and in about 40 per cent of cases of amoebic dysentery. (See *DD 11*, page 4.) Blood is visible in less than 10 per cent of the stools of patients with diarrhoea caused by other common organisms. (*Stoll et al. 1983. BMJ 286. 2037-40.*) With a simple microscope it is often possible to distinguish bacillary from amoebic dysentery. More than 50 white blood cells seen per high power field is typical of a shigella infection. In amoebic dysentery, the amoebae containing red blood corpuscles can often be seen moving about under the microscope.

### Drugs? Only when necessary

Man is a medicine taking animal and irrationally tends to believe that there must be “a pill for every ill”; it is often difficult to convince people that the best treatment for most diarrhoeas is a simple drink and not a drug. The major problems associated with drugs for diarrhoea include:

- Inflated ideas about the efficacy of medicines. Doctors as well as patients often wrongly believe that drug treatment is essential. Drugs are needed in only a few conditions and some of these are discussed on page 5.
- Incorrect use of antibiotics. The commonest organisms which cause diarrhoeal disease are either not susceptible to antibiotics, for example, rotavirus, or the antibiotics do more harm than good, as in salmonella food poisoning. Indisciplined prescribing and insufficient dosage worsen the problem of



Photo by William Cutting

**Rehydration: still the life-saving treatment in the majority of cases of acute diarrhoea.**

bacterial resistance to antibiotics.

- Inappropriate promotion and advertising of antidiarrhoeal medicines perpetuates the belief, in the minds of both the public and the health professionals, that a medicine is the answer to the problem of diarrhoea.
- Insufficient supplies of drugs for the people who actually need them.

The use of drugs in diarrhoeal disease distracts both parents and health professionals from the life-saving treatment for the majority of cases of acute diarrhoea – rehydration.

**WAMC and KME**

## In this issue . . .

- Drug therapy
- Dysentery
- Care of medicines

## AHRTAG

Appropriate Health Resources &  
Technologies Action Group Ltd

## International Health Congress

The International Health Congress of the World Federation of Public Health Associations will hold its fifth conference in Mexico City, on 22-27 March 1987. The theme of the Congress is 'International Health in an Era of Economic Constraint: The Challenge'. Abstracts must be submitted by 15 October 1986, in English or Spanish. For further information please contact: *WFPHA Secretariat, c/o American Public Health Association, 1015 15th Street, NW, Washington DC 20005, USA.*



9:00AM



9:15AM

## Diagnostic needs: questionnaire

The Programme for Appropriate Technology in Health (PATH), is currently undertaking a survey to identify the priority diagnostic procedures needed for patient care in developing countries. The results will help to formulate research priorities, and to define the most important characteristics for diagnostic tests. If you are interested in taking part in the survey, please write for a questionnaire to: *Vivien Davis Tsu, Editor, Directions, PATH, Canal Place, 130 Nickerson Street, Seattle, WA 98109, USA.* All survey participants will receive a report summarising the main results.



10:00AM



1:15PM

## ORT in practice

An Egyptian infant – dehydrated from the effects of diarrhoea – is treated with life-saving oral rehydration therapy (ORT). At 9:00am, the child's sunken fontanelle is a clear sign of dehy-

dration. Within hours, the child is out of danger; and is able to resume breastfeeding by 1:15pm.

**National Control of Diarrhoeal Diseases Project (NCDDP), 20a Gamal el Din Abul Mahassen St, Garden City, Cairo, Egypt.**

## Child Survival Action News

Child Survival Action News is a new quarterly newsletter aimed at promoting child survival programmes in the developing world. The newsletter will focus on immunisation, growth monitoring, birth spacing, maternal health, the promotion of breastfeeding, and improved nutrition practices. For further information and sample copies, write to: *Child Survival, National Council for International Health, 1101 Connecticut Avenue, NW, Suite 605, Washington D.C. 20036, USA.*

## ORT literature

The PRITECH Project (Technologies for Primary Health Care) produces a monthly bibliographical listing, ORT Technical Literature Update. Each listing contains up to eight annotated articles from the current literature on oral rehydration therapy and related health issues. The focus is primarily technical, but future issues plan to include operational and programme

related literature. The articles are selected by the editors, Dr Jon Rohde and Dr Robert Northrup, on the basis of possible interest to readers rather than purely on scientific merit. For more information contact: *Elizabeth Jennings, Director, PRITECH Information Center, Suite 700, 1655 North Fort Myer Drive, Arlington, Virginia 22209, USA.*

## DD subscriptions

Due to rising costs and rapid expansion of the English mailing list, we are no longer able to distribute *DD* everywhere free of charge. We are therefore asking all our readers in North America and Western Europe, who can afford to do so, to make a small contribution in the form of a subscription fee. \$10.00 / £5.00 would cover the cost of producing and distributing your copies of *DD* for one year. This obviously does not apply to those who have already subscribed, or who are exempt for any reason – for example, if you contribute to *DD*, or work for an agency which funds the newsletter or distributes *DD* to health workers in developing countries.

Cheques, bank drafts, or international money orders should be made payable to 'Dialogue on Diarrhoea' (AHRTAG). Please make payments in £ sterling or US \$ and write your subscription number, if you have one, on the back of the cheque.

## Directory of periodicals

A Directory of Development Education Periodicals, containing information about publications by international and national NGOs and United Nations organisations, is now available free of charge to Third World NGOs, at \$10.00 for other NGOs, and at \$15.00 for other organisations and individuals. Readers should write to: *NGLS, United Nations Office at Geneva, Palais des Nations, CH 1211 Geneva 10, Switzerland.*

## Getting the message across

The management of childhood diarrhoea is one of the major priorities in Uganda today, and ORT is the main weapon being used. In order to help their efforts to educate rural mothers about ORT, postgraduate students at

the Institute of Public Health in Kampala designed this poster during sessions on diarrhoeal disease management under the supervision of Dr G Bukenya.



The message is blunt and dramatic. It demonstrates that diarrhoea kills, but that the child can be saved if ORT is started early. The poster will soon be field-tested in a number of villages in Uganda.

**Dr Gilbert Bukenya, Department of Community Medicine, University of Papua New Guinea, P.O. Box 5623, Boroko, Papua New Guinea.**

## Health care – a wider approach

In a future issue of *DD* the editors plan to focus on the *implementation of health care, particularly diarrhoeal disease control activities, through the work place and community groups.* Readers who would like to contribute to this feature are invited to write to *DD* describing their experiences. The provision of health care for plantation workers and their families is one example of this approach, to be discussed at a one day meeting entitled 'Health and Health Services for Plantation Workers'. This meeting

will be held at the London School of Hygiene and Tropical Medicine on Thursday 4 September. For further information please contact *Dr R Laing, Institute of Development Studies, University of Sussex, Falmer, Brighton BN1 9RE, U.K.*

## ORT in Saudi Arabia

**A Saudi mother encouraging her child to drink oral rehydration solution at the Quwazah Primary Health Care Centre in Jeddah.**



*Photo by Muneera Hamdan Al-Osemi*

## In the next issue ....

*DD 26* will focus on the effect of seasonality and social factors on the incidence of diarrhoea. This issue will also contain an update of sources of information and resource material for diarrhoeal disease.

The Editors would like to thank all those readers who have filled in and returned their *DD* questionnaires. Your comments and suggestions are much appreciated and will be very helpful in planning content of future issues of *DD*. The results from the analysis of the questionnaire will be published in *DD* later this year.

# Dysentery: an overview

## Still problems to resolve

Sudhir Pal reviews the global situation and findings from the recent dysentery epidemic in West Bengal.

Bacillary dysentery, characterised by frequent passage of blood and mucus in the stools, and accompanied by excruciating abdominal pain, fever and intense weakness, has long been recognised as the cause of many deaths during wars, famines and other disaster situations. The disease occurs worldwide, but most frequently in countries where hygiene and sanitation are poor. In these countries endemic shigellosis is a significant cause of illness and death, particularly in young children.

### Cause and transmission

The infection is caused by bacteria of the genus *Shigella*; hence the name shigellosis or bacillary dysentery. The shigella genus has four sub-groups: *S. dysenteriae*, *S. flexneri*, *S. boydii*, *S. sonnei*; and 39 serotypes. The most severe infections are caused by the *S. dysenteriae* type 1 (also known as Shiga's bacillus), which may occur in epidemics.

Man is both the reservoir and natural host of *Shigella*. Infection is by the faecal-oral route and is usually spread by person-to-person transmission. It takes only 10 to 100 shigella organisms to produce dysentery, a low infectious dose, whereas one million to ten million organisms may need to be swallowed to cause cholera.

During the late 1960s, Shiga's bacillus was responsible for a series of devastating epidemics of dysentery in Latin America, Asia and Africa. In 1967 it was detected in the Mexican-Guatemalan border area and spread into much of Central America. An estimated half million cases, with 20,000 deaths, were reported in the region between 1967 and 1971. In some villages the case fatality rate was as high as 15 per cent; delayed diagnosis and incorrect treatment may have been responsible for this high death rate. One particularly disturbing feature was the resistance of the bacteria to the most commonly used antibacterial

drugs: sulfonamides, tetracycline, chloramphenicol and streptomycin.

### Recent outbreaks

Serious epidemics due to the multiple-drug resistant *S. shigae* have occurred recently in Bangladesh, Somalia, South India, Burma, Sri Lanka, Nepal, Bhutan, Rwanda and Zaire. Each epidemic showed similar features: the disease spread rapidly in spite of all available public health measures, attacking over 10 per cent of the population and killing between two and ten per cent even of the hospitalised cases.

West Bengal in India has always been an endemic area for bacillary dysentery. In 1984, greater numbers of dysentery cases started occurring and spread rapidly throughout the state. Investigations revealed that attack rates were high, especially among young children, and that all the shigellae isolated from stool specimens were resistant to the commonly used drugs.

In response to the outbreak, control measures were initiated, newspapers, radio and television carried information about the epidemic to raise public awareness; and district level health personnel were alerted. Reports came in of increasing numbers of dysentery cases, between two and three thousand new cases, and up to 150 deaths, a day. People began to panic and doctors were frustrated by the ineffectiveness of conventional treatment.

### Resistance to antibiotics

The epidemic spread to Calcutta, where stool samples from 382 patients showed Shiga's bacillus in 35 per cent of cases, and different species of shigella organisms in 52 per cent. These organisms were sensitive to nalidixic acid (96.7 per cent), gentamicin (83 per cent), furazolidone (77.7 per cent), and; moderately sensitive to ampicillin

(42.2 per cent), kanamycin (37.4 per cent), neomycin (21.8 per cent) and cotrimoxazole (23.2 per cent), but were resistant to other commonly available drugs and antibiotics. For most doctors this was their first experience of coping with an epidemic of severe bacillary dysentery and there was great confusion over the choice of antibacterial drugs and other treatment. Nalidixic acid, although found to be most effective, was too expensive for common use. Oral rehydration, the magic therapy for acute watery diarrhoea, was effective in only about ten per cent of these cases, since in 90 per cent dehydration was not serious.

### Preventive measures

A mass media campaign was begun which advocated boiling or chlorination of drinking water, covering faeces with soil, protecting food from flies, avoiding eating exposed raw vegetables and cut fruits, and washing hands with soap and water before eating and after using the latrine. However, such measures are not easy to implement in some areas. In West Bengal, for example, the total production of water-purifying tablets was only enough to meet requirements for one or two days; scarcity of fuel limits its use for boiling drinking water; and while there is convincing evidence that handwashing with soap and water reduces transmission of shigella, people cannot be educated overnight to do this. Consequently the epidemic took its own course and subsided only gradually.

The reasons for the recent emergence of Shiga dysentery are not fully understood. Resistance of the causative agent, Shiga's bacillus, to most commonly used and available drugs is a major problem, and the case fatality rate is very high. Scientific knowledge about the exact mode of transmission of the pathogen, the mechanisms of pathogenicity and even about the actual cause of death due to the disease, is still inadequate. Such knowledge might contribute to the development of better and more practicable public health intervention measures, and an effective vaccine.

**Dr Sudhir Chandra Pal, Director,  
National Institute of Cholera and  
Enteric Diseases, Calcutta, India.**

## Drug treatment

### Bradley Sack outlines current understanding of the use of drugs for treating certain types of diarrhoea.

The first objective of therapy for all diarrhoeal diseases is replacement of the fluids and electrolytes lost in the liquid stools during the illness. In some dysenteric illnesses, however, fluid losses are relatively minor and the main clinical symptoms of fever, abdominal pain and toxicity are the result of invasion and destruction of the epithelial cells lining the intestine, by pathogenic organisms or their toxins. In these illnesses, antimicrobial therapy has a major role.

#### Antimicrobial drugs

- In most diarrhoeal diseases, antimicrobial drugs have no proven value and should not be given.
- In some severe diarrhoeal illnesses, antimicrobial therapy can be lifesaving. These include dysentery caused by *Shigella*, especially *S. dysenteriae 1* and some cases of prolonged diarrhoea. Fortunately, these are relatively uncommon, except for the present widespread outbreaks of *S. dysenteriae 1* in some parts of the world. In order to treat these illnesses most effectively, the laboratory is important both to make the correct bacteriologic diagnosis and to indicate which antimicrobials will be most effective.
- In cholera antimicrobials may be useful when given in addition to ORT because they shorten the duration of illness and reduce the volume of stool loss.
- Antibiotics may also have some value in milder forms of dysentery due to *Shigella*, and possibly in serious diarrhoea due to enteropathogenic serotypes of *E. coli*, and the clinical syndrome of travellers' diarrhoea. In diarrhoea due to *Campylobacter jejuni*, antimicrobial therapy is only useful if it is begun in the early stages of the illness, which is not usually possible because detection of the organism requires at least two days using special laboratory facilities.
- Antimicrobials are contraindicated in diarrhoea caused by non-typhoid *Salmonella*, unless the *Salmonella* caused systemic invasion, because they are of no clinical benefit and

they prolong the excretion of these organisms in the stool.

- Antiparasitic drugs are valuable in symptomatic cases where trophozoites of *Entamoeba histolytica* or *Giardia lamblia* are detected by microscopic examination of fresh stool specimens.

#### Antimotility drugs

These include synthetic opiates, such as loperamide and diphenoxylate, and morphine derivatives such as pargoric. In infantile diarrhoea and non-dysenteric types of travellers' diarrhoea, antimotility drugs slightly reduce the duration of illness, but do not decrease the rate of stool output, as they are not significantly antisecretory in action. These drugs may give some symptomatic relief in adults, but are contraindicated in children under 5 years old because of possible harmful side-effects, such as depression of respiration and altered consciousness. In cases of dysentery, antimotility drugs may actually increase the severity of the illness because clearance of the invasive organisms from the colon may be delayed.

#### Antisecretory drugs

Two drugs, chlorpromazine and berberine, have demonstrated antisecretory effects, but neither has yet proven practical for routine use.

- Chlorpromazine reduces stool output somewhat in severe cholera, but it has little effect in patients whose illness is not severe. For this reason, and because it causes sleepiness, its use is not recommended.
- Berberine is a traditional anti-diarrhoea medicine in Asia. In studies on animals, it has been shown to reduce stool output caused by enterotoxins of *V. cholerae* and *E. coli*. However, studies in humans have not shown consistent beneficial effects. It is not recommended for the routine management of diarrhoea.

#### Other drugs

Bismuth subsalicylate is moderately effective in adults with travellers' diarrhoea, but the dose required is very

large. Its mechanism of action is unknown. Cholestyramine is a non-absorbable basic anion exchange resin. It acts both by deconjugating bile salts and binding bacterial toxins. Preliminary trials suggest it reduces the duration of diarrhoea in infants and further studies are underway. In combination with certain oral antibiotics (i.e. gentamicin and neomycin), it has been effective in treating persistent diarrhoea, that is cases in which acute diarrhoea continues for more than 14 days. High dosage may prolong acidosis and there is not yet enough evidence to recommend the drug for routine use.

There is no evidence of efficacy for kaolin and pectin or any of a large number of other drugs, including traditional medicines and anti-inflammatory agents such as aspirin.

#### Guidelines for use of drugs

Although recommendations regarding the role of drugs in diarrhoea therapy are incomplete, and often require laboratory back-up, the following general guidelines may be useful, particularly when adequate laboratory support is not available:

- In patients with watery (non-bloody) diarrhoea no antibiotics are indicated unless cholera is strongly suspected, as for example during a cholera epidemic. In that case tetracycline or another antimicrobial effective for *V. cholerae* should be used.
- In patients with dysentery, especially children who are febrile (temperature greater than 38.5 °C) or who appear seriously ill, appropriate antimicrobials such as ampicillin or trimethoprim-sulphamethoxazole (co-trimoxazole) should be given. The choice of antibiotic should be based on known antimicrobial sensitivity patterns of *Shigella* strains in the geographic area.
- There is no rationale for using any "anti-diarrhoeal drug" for routine management of acute diarrhoea, especially in children under 5 years old. Fluid and electrolyte replacement (ORT) remains the primary treatment for all diarrhoeal diseases.

**Professor R. B. Sack, The Baltimore City Hospital, 4940 Eastern Avenue, Baltimore, Maryland 21224, U.S.A.**

## Medicines with care

Drugs must be purchased, stored and distributed with professional skill. Patients should use them carefully; this often depends on clear instructions. In this article Professor D'Arcy and Dr Harron outline some practical guidelines.

### Purchase

- All medicines must be purchased from reliable and well proven sources; if purchased in bulk by Third World health authorities, then advantage should be taken of the WHO certification scheme, through which the quality of medicines is assured.
- If medicines are purchased by the individual patient, then, where possible, professional advice should be sought, preferably from a pharmacist. It can be dangerous to buy medical supplies from non-official or non-professional sources.

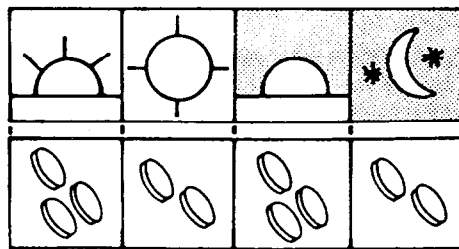
### Storage

- Medicines must be stored with care. The basic requirements are the same both for home storage and bulk dispensary storage.
- Medicines:
  - must be kept in a cool and dry place;
  - bulk containers should be stored off the ground so that they cannot be spoiled by rain puddles;
  - should never be allowed to stand in the sun;
  - should be protected in sealed containers, from attack by insects and rats and containers should be properly labelled;
  - must not be used after their expiry date – often this is marked on the label – if not, assume two years from purchase for all solid dosage forms and one year for liquid preparations and creams and ointments. Discard any medicines that show discoloration, fungal growth or any other signs of physical deterioration.
- Some medicines need storage in a refrigerator at a temperature below 5°C; this requirement is usually shown on the container. Do not place any medicines in the freezing compartment of the refrigerator (except for some vaccines which should be stored frozen.)

COSTLY MEDICINES WILL DETERIORATE IF THEY ARE NOT STORED CORRECTLY.

### Containers and labelling

- All bulk medicines must be stored in suitable closed containers which are labelled to indicate the nature of the medicine, its source, quantity, dosage and, where applicable, its expiry date.
- Smaller quantities of medicines prepared for individual patient use must be dispensed in a suitable clean and closed container which is labelled with the name of the medicine, the name of the patient, the date of supply, and the instructions for use in a form that can be readily understood by the patient (if necessary pictograms should be used to illustrate the required dosage schedule):



Medicines must not be supplied to patients in a screw of paper or in an open and unwashed container provided by the patient. Every distribution system of medicines should consider the provision of cheap, closable, multipurpose containers as a priority.

### Distribution to the patient

- Distribution of medicines should always be in the care of a trained health care worker (preferably supervised by a pharmacist and according to the prescription of a doctor) who dispenses them in a suitable container.
  - Labelling of medicines should be reinforced by verbal instructions to the patient or relative. Check to make sure that the instructions have been understood before the medicine is handed over.
- COSTLY MEDICINES WILL BE WASTED IF THEY ARE NOT USED CORRECTLY.

### Special precautions with medicines for diarrhoea

Oral rehydration salts (ORS) are available through the United Nations Children's Fund (UNICEF) in water-proof foil packets. Both WHO and UNICEF are assisting countries to produce WHO-recommended formulations of ORS; for local production WHO recommends packaging of ORS in polythene where possible. The ORS formulation containing trisodium citrate dihydrate (ORS-citrate) is more stable than the sodium bicarbonate formulation (ORS-bicarbonate) especially in tropical countries where it has to be stored in conditions of high humidity and temperature. Avoid the use of non-WHO recommended formulations of ORS which may be less effective, less stable and more expensive.

Although the use of germ-free water is preferable for mixing the rehydration solution, ORS solution for oral rehydration can be prepared even when pure water is not available. The cleanest safest local water should be used. However, where possible, boil and cool the water before use. To minimise contamination, ORS solution should be made fresh every day, covered and stored in a cool place. Ensure that the volume of water in which the ORS is dissolved is correct. This is vital both in the pharmacy and the home. Check that the patient's relatives understand about the correct volume, and possess a suitable container.

Solutions for intravenous infusion have a role in the treatment of severe dehydration in diarrhoeal diseases. Care is needed as some solutions do not contain appropriate or adequate amounts of electrolytes required to correct the losses from dehydration associated with acute diarrhoea. The needles, tubing, containers (bottles or plastic bags), and fluids used for intravenous therapy must be sterile. Correct storage of these components is therefore crucial and storage conditions must maintain sterility. It is not necessary to store infusion fluids in a refrigerator. The containers should be inspected at regular intervals for damage caused during transport or storage (e.g. leaks, cracks, or splits in containers); all damaged containers should be discarded.

When in use, it is helpful to mark intravenous fluid bottles at various levels with the times at which the fluid should have fallen to those levels. This allows easy and rapid monitoring of the rate of administration of the fluid.

**Professor P F D'Arcy, Department of Pharmacy, and Dr D W G Harron, Department of Therapeutics and Pharmacology, The Queen's University of Belfast, Lisburn Road, Belfast BT9 7BL, Northern Ireland.**

# Development of oral rehydration

## Australia

### Diarrhoea in Aboriginal children

The Aboriginal population in Central Australia live mainly in rural or remote areas and, while they represent less than a third of the total population served by the Alice Springs Hospital, their levels of mortality and morbidity from diarrhoeal disease are disproportionately high. In the early 1960s, the infant mortality rate among the Aboriginal population was almost 250 per thousand live births, one of the main causes of death being acute diarrhoea – often in epidemic form and usually associated with protein energy malnutrition.

#### Oral rehydration

The rehydration fluid recommended at that time was dextrose in normal saline solution (DNS) and many infants died of hypokalaemia (potassium deficiency) during outbreaks of what was probably rotavirus diarrhoea. These infants were often severely dehydrated and passed little or no urine, and it was considered dangerous to give potassium when there was no evidence of kidney function. During one epidemic in 1966, sodium and potassium concentrations in diarrhoeal stools were measured. The findings led to a modified oral electrolyte mixture (MEM) containing potassium. Mortality rapidly decreased once MEM was in common use. MEM powder was dispensed in small jars and had a relatively short shelf life. Significantly however, the formula was similar to that of UNICEF oral rehydration salts (ORS) in foil sachets, which became available a little later. ORS has now replaced MEM and is used extensively throughout Central Australia.

#### Teaching health workers about ORT

The use of ORS, recognition of danger signs of dehydration, and the supervision of mothers during rehydration of their children are all basic skills taught to the Aboriginal Health Workers and, despite occasional epidemics of diarrhoea, deaths from the disease are far less

frequent than they were. A card with a sliding insert, was designed to help literate health workers and parents assess the levels of dehydration, carry out a standard treatment for diarrhoea and monitor progress. (The technique of intraperitoneal infusion was refined and introduced as a life-saving measure where oral rehydration therapy had failed. A card describing this procedure was produced and distributed.)\*

#### Remaining problems

Although mortality levels from childhood diarrhoea among Central Australian Aboriginals have fallen dramatically over the past 20 years, due largely to the introduction and widespread use of an appropriate oral rehydration solution, the incidence of diarrhoea, caused by organisms such as shigella, campylobacter or salmonella, continues to be extremely high, and the admission rate to the base hospital at Alice Springs is of great concern. Very few children avoid at least one hospital admission for diarrhoea during their first year of life, and some are admitted many times. Diarrhoea makes an important contribution to the under-

nutrition seen in more than 20 per cent of Aboriginal children under the age of five years.

The continuing high attack rate of diarrhoea is almost entirely related to problems of poor diet, living conditions, and lack of awareness of the importance of community and personal hygiene.

**Dr Kerry Kirke, Regional Director, Alice Springs and Barkly Region, Department of Health, P.O. Box 721, Alice Springs, N.T. 5750, Australia.**

Copies of the diarrhoea slide rule are available from the Assistant Director, N.T. Health, at the above address.

*\*Editors' note: With modern and efficient oral rehydration therapy there is virtually no place for intraperitoneal infusion nowadays. If a child is shocked it needs rapid expansion of blood volume by intravenous infusion. A child who is unconscious or vomiting a lot can receive ORS solution by naso-gastric tube.*

## Pakistan

### Early use of ORS

In 1970, when Professor Abdul Billoo took charge of the Paediatric Unit at the Civil Hospital in Karachi, nearly half the cases admitted were suffering from diarrhoea and dehydration. The treatment method used was I.V. therapy but the resources available, in terms of time, manpower and I.V. fluids and equipment, were not sufficient to cope with the number of patients – and many died.

After some experimentation, in 1972 the Unit started giving by mouth a solution of half strength saline (0.45 % Na Cl) and 4.5 dextrose in water\*. At that time this was found to be fairly safe, effective and acceptable, and greatly reduced the need for use of I.V. drips. Home-made solutions, using the correct proportions of salt, sugar and water, have since been successfully promoted in six outreach rural diar-

rhoea education programmes. Citrus fruits, particularly oranges, and also bananas, are freely available in Pakistan, and are promoted as a good source of potassium. The first trial of an oral rehydration solution was made by Professor Billoo on two six month old children of some friends of his, both suffering from severe diarrhoea, and moderate dehydration. Both children responded well, and were fully recovered in 72 hours. "Both of them are now happy and healthy young boys of 14 years, and I was proud of them and grateful to their parents for their contribution to the success story of ORT in Karachi, which has a population of 7 million and where now nearly 70 per cent of mothers are aware of the use of ORT in diarrhoea."

**Professor A G Billoo, Professor of Paediatrics, Dow Medical College and Civil Hospital, Karachi, Pakistan.**

*\*These proportions are not sufficient to make an adequate oral rehydration solution. The WHO recommended formula with the correct proportion of ingredients should be used.*



## Carry on feeding

*Diarrhoea Dialogue* is a regular part of our medical student teaching programme in Social Paediatrics at Makerere University.

While convinced that ORT will prevent dehydration by early home management of diarrhoea, and effectively rehydrate the mild to moderately dehydrated children brought to health centres, clinics and hospitals, ORT is not the complete management of the child with diarrhoea and prolonged use of ORT without adequate attention to calorific and nutritional requirements can be disastrous. Emphasis should be placed on meeting these essential requirements by continuing and, if possible, augmenting feeding. Many health workers and parents persist in restricting food including milk during ORT.

As sole feeding ORT provides less than 5 per cent of calorific needs and no other nutrients. With its wide circulation we urge that *Diarrhoea Dialogue* should continue to stress feeding during ORT as in issue 15. (See DD issue 23.)

**D A Hillman, Professor of Social Paediatrics, Child Health and Development Centre, Makerere University, Kampala, Uganda.**

## Leaf nutrient for malnutrition

In your issue No. 23, December 1985, you had articles on feeding the anorexic child and on leaf nutrient. Unfortunately the relationship between the two was not made clear. Actually leaf nutrient is one of the best foods to provide for children recovering from diarrhoea. The moist product is soft so it does not need chewing; and it can easily be made either sweet or spicy. A 40 gram portion of 50 per cent moisture content material will provide a child with 12 grams of protein, about 40 per cent of his normal daily needs. It will also provide all the required vitamin A as beta carotene. This, according to

West and Sommer (*Food Reviews International 1 (2) p. 355-418 (1985) and The Lancet, May 24, 1986.*) can be of vital importance in reducing mortality and morbidity rates for children. In addition, leaf nutrient contains significant amounts of many other vitamins as well as calcium, iron and several other essential minerals.

Studies have shown that where there is a reliable supply of fresh green leaves, leaf nutrient costs only twice as much as cereal grains or about the same amount as beans and other legumes. Cost analyses have shown that leaf nutrient is actually a least cost food which provides many of the nutrients required by man. As such it can and should play a vital role in combating malnutrition around the world.

**Walter J Bray, Sesaco Corporation, P.O. Box 4546, Yuma, Arizona, 85364, USA.**

**Editors' note:** *We would like to thank Dr Bray for pointing out the value of using leaf nutrient for children with malnutrition, and during recovery from diarrhoea. However, it is not always simple to produce, and where it is not available, other foods should be given during and after the recovery period of diarrhoea. (See articles in DD23.)*

## Different tastes in water

Recently I have observed that the rural children, brought to our hospital with diarrhoea, do not accept oral rehydration fluid as well as the town children. While searching for the cause, a mother said 'My child is used to drinking well water and your municipal tap water is tasteless.' The child accepted the well water readily. Since then we have started asking whether a child is used to well water or tap water and have started offering ORS in the water a child is used to. Our acceptance rate of ORS has increased since then.

**Dr Anil Mokashi, Editor, Journal of Rural Paediatrics, Baramati, 413102, India.**

## ORT activities in Turkey

The main causes of child death in Turkey are bronchopneumonia and diarrhoea. The first step taken in the field of child health was an immunisation programme targeted at children aged under five years which has achieved a remarkably high coverage rate: over 80 per cent. The second step towards lowering child mortality rates was the decision to use ORS in diarrhoea.

As part of the new ORT programme, the Ministry of Health and Social Affairs and the Hacettepe Children's Hospital have worked together on an ORT education programme. Two oral rehydration and diarrhoea research and training centres have opened in Hacettepe Children's Hospital and the Gulveren Health Centre. Gulveren Health Centre is in a rural 'pilot' area of the University. It serves a population of 65,000. Mothers accepted the training programme with great interest and more than 200 have already been taught about ORT in each centre. It is expected that this number will rise once the educational programme begins and with the help of promotion on television. A team has been established in Hacettepe Children's Hospital to work on diarrhoea control with the Ministry, in collaboration with UNICEF and WHO.

**Atilla Buyukgebiz M.D. and Benal Buyukgebiz M.D., Gulveren Health Centre, Ankara, Turkey.**

**Editors' note:** *A range of maternal and child health programmes are underway in Turkey, led by the Ministry of Health and Social Affairs in co-operation with the Ministry of Education, and DD will focus on these activities in a future issue. In recognition of outstanding achievements in child survival activities, Turkey received a special award in June 1986 at a National Council for International Health meeting held in Washington D.C.*

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