

RATIONAL USE

Rational management of diarrhoea in children

From ORS to case management of diarrhoea

SINCE the introduction of oral rehydration salts (ORS) solution in the late 1960s, its role and benefits in the management of diarrhoea have gained wide recognition. The majority of health professionals in both developing and industrialized countries now regard oral rehydration therapy (ORT) – which is the use of appropriate fluids including ORS – as the most effective treatment for patients who are suffering from dehydration due to diarrhoea. Dehydration (the loss of body fluids and salts) is a frequent result of diarrhoea and can rapidly become fatal in children. So, ORT is an effective means of preventing children from dying of diarrhoea – a serious problem in developing countries. It is estimated that in the developing world there are around 1.5 thousand million diarrhoea episodes and 3 million deaths in children under five each year. The worldwide application of ORT could save the lives of the great majority of these children. Not surprisingly, the medical journal *The Lancet* once described the discovery of this therapy as “potentially the most important medical advance this century”.

However, it is now clear that the effective management of diarrhoea requires more than just the treatment of dehydration. Correct case management of a child with diarrhoea involves both family and health workers. The key rules are:

- The prevention of dehydration has to start at home by giving the child increased amounts of fluids, such as rice water, tea, gruel, and other appropriate fluids that are commonly used in the community.

- If the child becomes dehydrated (which may occur despite increased amounts of fluids), it is important to take her/him to a health worker for assessment and treatment. A child with dehydration should be treated with ORS, which guarantees fast and optimal rehydration and prevents further dehydration.

- The child should be fed normally during and after the diarrhoeal episode. This prevents malnutrition and, just as important, helps a quick recovery. Scientific research has clearly shown that children who receive adequate nutrition during diarrhoea recover faster than those from whom food is withheld¹.

- Children who are severely dehydrated – usually only a small proportion – should be rehydrated intravenously.

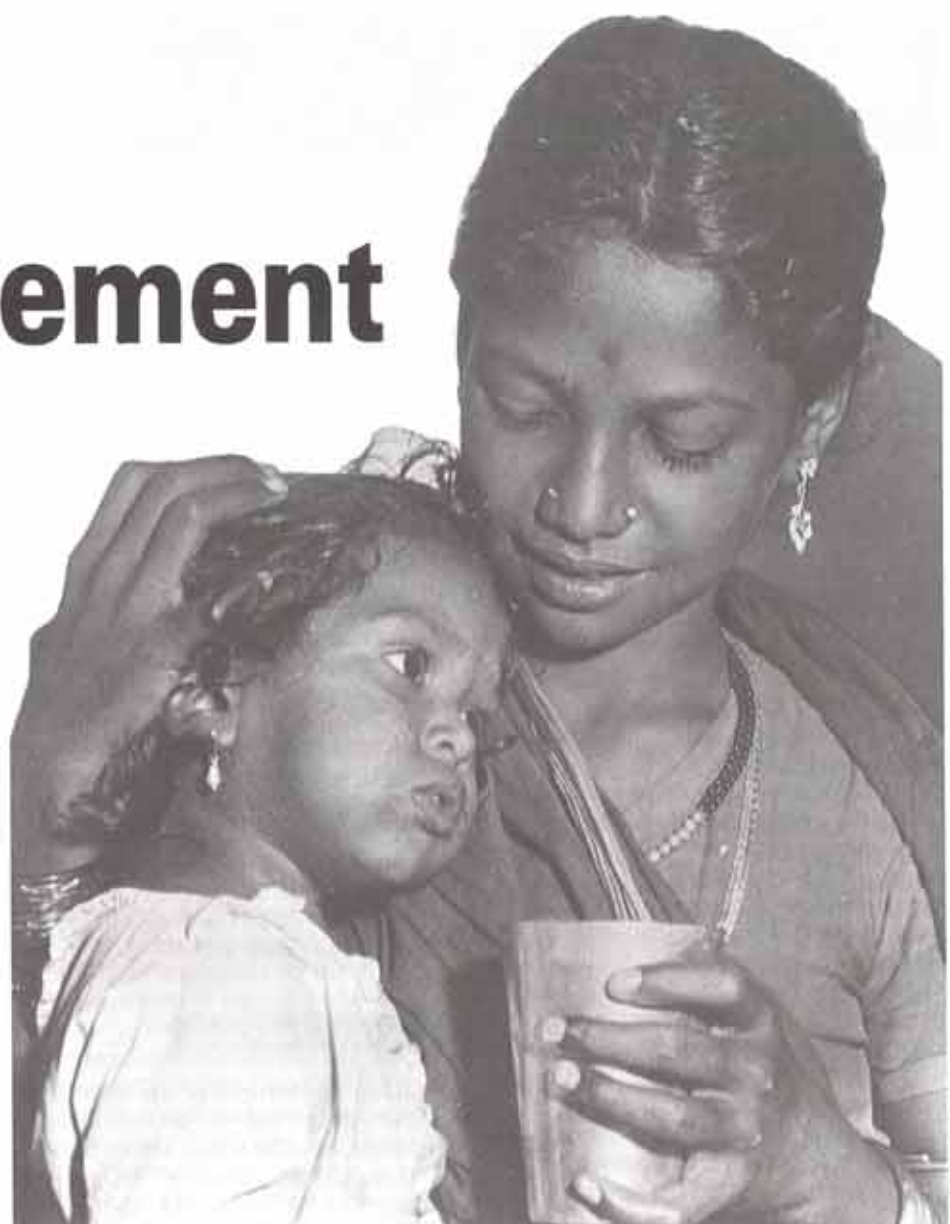
- Drugs are indicated only for dysentery and suspected cases of cholera. Very clear guidelines exist for the selective use of effective and relatively cheap antimicrobials in such cases². Although in many countries large quantities of “antidiarrhoeal” preparations or antiemetics are being used for the management of diarrhoea in children, there is absolutely no scientific rationale for this practice (Fig. 1).

For the vast majority of diarrhoea cases, a laboratory diagnosis is not needed. Most diarrhoea is self-limiting and can be handled satisfactorily simply by correctly applying the above recommendations.

Figure 1: Excerpt from the revised WHO diarrhoea treatment chart “Management of the Patient with Diarrhoea”

Use of drugs for children with diarrhoea

- ANTIBIOTICS should ONLY be used for dysentery and suspected cholera. Otherwise, they are ineffective and should NOT be given.
- ANTIPARASITIC drugs should ONLY be used for:
 - Amoebiasis, after antibiotic treatment of bloody diarrhoea for *Shigella* has failed or trophozoites of *E. histolytica* containing red blood cells are seen in the faeces.
 - Giardiasis, when diarrhoea has lasted at least 14 days and cysts or trophozoites of *Giardia* are seen in faeces or small bowel fluid.
- ANTIDIARRHOEAL DRUGS and ANTIEMETICS should NEVER be used. None has proven practical value. Some are dangerous.



Treatment with oral rehydration salts - which mothers can give at home - can save many children's lives in the developing world.

The impact of national CDD programmes

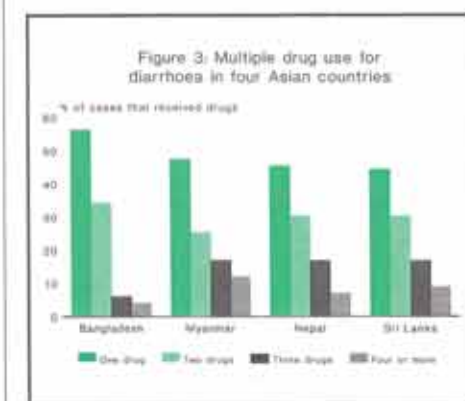
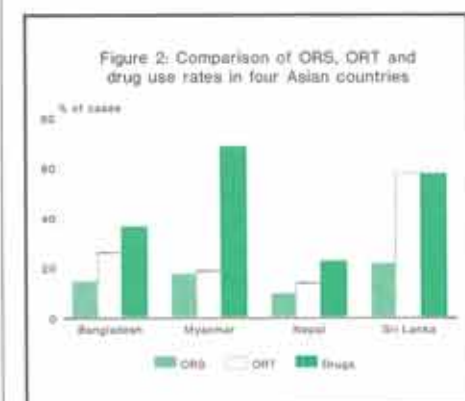
Since the early 1980s practically all the developing countries have implemented diarrhoeal disease control (CDD) programmes. Many of these programmes have had success through the acceptance of ORT by the general public and health professionals. Moreover, CDD programme activities have led to a considerable increase in access to ORS and use of ORT at the global level since 1980³. ORS is currently being produced in about half of the developing countries.

Surveys conducted in a number of countries indicated that, on average, the hospital admission rate for diarrhoea dropped by 61% after the introduction of ORT and the average case-fatality rate was reduced by 71%⁴. An additional advantage of such changes is a significant reduction in hospital costs for diarrhoea treatment; some hospitals have reported a saving of as much as 60%. It is estimated that improved case management has had a significant effect on childhood mortality, although it is difficult to measure the decline in diarrhoea-associated deaths that has resulted from the activities of CDD programmes.

The drug use problem

Despite the progress made, appropriate case management of childhood diarrhoea tends to be the exception, rather than the rule. Although the rational management of diarrhoea includes a selective use of drugs, the reality in most developing countries is that inappropriate drugs are used routinely for a large proportion of

diarrhoea cases. Surveys carried out in four Asian countries have shown that use of drugs is far more common than the use of ORS. While ORS was used in 9% to 21% of all episodes, other drugs were used in 22% to 68% of episodes (Fig. 2)⁵. Multiple drug therapy was very common (Fig. 3)⁵. This unnecessary use of drugs is extremely costly. For instance, in the period 1988-1989, it is estimated that in Peru more than US\$ 2 million was spent on antidiarrhoeal preparations⁶. This expenditure cannot be justified.



RATIONAL USE

Disadvantages of the irrational use of drugs for diarrhoea

The use of antidiarrhoeal drugs and the routine use of antibiotics are not only unjustified, they also have many disadvantages.

One of the most serious is that they divert attention from the correct management of diarrhoea. When prescribing, dispensing, and administering a drug, the doctor, the pharmacist, and the mother might think that they have done what is best for the child with diarrhoea. However, preventing and treating dehydration, feeding, and monitoring the condition of the child, may have been neglected. Taking an antidiarrhoeal drug does not prevent dehydration.

Another disadvantage of most drugs used for children with acute diarrhoea is that they have no proven value for this condition. Although the most commonly used products claim to diminish the severity or duration of diarrhoea, they do not reduce the life-threatening fluid losses that can be associated with childhood diarrhoea. Carefully designed studies have shown that these drugs reduce neither the number of stools passed by a child with diarrhoea nor the period of illness².

There are also very negative economic consequences. Countries incur considerable costs in acquiring antidiarrhoeal drugs. For most developing and developed countries the share of drugs in the national health budget is very large: WHO has estimated that drugs account for more than 40% of health care costs. Governments and families often spend scarce resources on unnecessary drugs; poor families may even have to sell food for this purpose.

Many drugs used for children with diarrhoea have serious side-effects, such as central nerve depression, gastrointestinal toxicity and an increase in the severity or duration of the diarrhoeal episode. Doctors and mothers often attribute the side-effects of drugs to the disease, rather than to the drug. Nevertheless, side-effects are found when properly looked for. Inappropriate use of antimicrobials also contributes to the development of resistance in microorganisms. It has recently been reported from Viet Nam that 50% of isolated *Shigella* strains are resistant to

ampicillin, chloramphenicol, tetracycline and sulfamethoxazole. Over 97% of the strains are resistant to at least one of the four antibiotics. The proportion of strains resistant to trimethoprim increased from 0.7% in 1984 to 10.7% in 1987, which gives cause for concern, in view of the fact that co-trimoxazole is the drug of choice for dysentery in Viet Nam⁶.

These are all reasons why doctors should not prescribe such drugs, pharmacists and drug vendors should not sell them, and families should not buy them.

A new WHO publication on the rational use of drugs in diarrhoea

In recent years, national CDD programmes have increasingly turned to WHO for technical information on the efficacy and safety of drugs used to treat children with diarrhoea.

Whatever strategies and activities a country may select and implement to counteract the irrational use of drugs, an indispensable first step will be to obtain scientific information to justify these actions. Scientific data on the pharmaceutical products used for diarrhoea have been appearing in the literature since the 1930s, and during the last three decades many studies have been carried out. Unfortunately, the majority of these reports are not easily available to national CDD programme



A dehydrated child too weak to move. Dehydration from non-specific diarrhoea is probably the greatest killer of young children in emergencies like droughts and famines.



One of the methods that the doctor or health worker can use to diagnose severe dehydration is to pinch the child's abdominal skin: if the skin goes back slowly (longer than two seconds) there is evidence that the child is dehydrated.

managers or drug regulatory authorities. In response to the many requests from countries, the WHO CDD Programme decided to review all the available literature on the efficacy and side-effects of the most commonly used antidiarrhoeals and antimicrobials. Experts from all over the world reviewed the resulting report, which has just been issued as a

WHO publication 'The rational use of drugs in the management of acute diarrhoea in children'². (See also Published Lately).

The book contains an introductory chapter on the correct case management of diarrhoea in children and reviews nine of the most commonly used antidiarrhoeal drugs, grouped into three categories: antimotility drugs, antimicrobial agents, and adsorbents (Table 1). A similar conclusion is reached for each of the nine products: **There is no rationale for the production and use of any of these products for the management of acute diarrhoea in children.**

What next?

The information in this new publication should be made widely available to policy makers, health professionals, health educators, and the trainers of doctors, nurses, pharmacists, and other health staff. In addition, CDD programmes are urged to take it into account when defining policy for the case management of diarrhoea in children, and in the design and implementation of educational, managerial and regulatory activities.

Source: WHO Division of Diarrhoeal and Acute Respiratory Disease Control.

References:

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3. WHO Diarrhoeal Disease Control Programme. Interim programme report, 1990. Unpublished document WHO/CDD/91.36.
4. Claeson M, Merson M.H. Global progress in the control of diarrhoeal diseases. *Pediatr Infect Dis J*, 9: 345-355, 1990.
5. Cruz H., Gastos para medicamentos innecesarios en diarrea. In: *Medicamentos inapropiados en diarrea: La magnitud del problema*. Colección científica No. 1, OPS/OMS, Lima, 1989.
6. Thi Vinh N, Wiedman B., Antibiotic resistance of *Shigella* strains isolated in Vietnam. *APUA Newsletter*, 7: 1-2, 1989. □

Table 1. Table of products reviewed²

Antidiarrhoeal Drugs	Abstract
ANTIMOTILITY DRUGS	
Diphenoxylate hydrochloride	No evidence that it alters the course of acute diarrhoea, or that it diminishes the losses of fluids. Central nervous system toxicity may occur in therapeutic dosages, and bacillary dysentery may be aggravated.
Loperamide	No evidence that it diminishes the losses of fluids or electrolytes when administered in conventional dosages. Adverse effects on the central nervous system have been observed in therapeutic dosages. Paralytic ileus has been associated with its use in infants and children.
ANTIMICROBIAL AGENTS	
Streptomycin and dihydrostreptomycin	No proven value in the treatment of diarrhoea; may actually increase the severity or duration of diarrhoea. Promotes resistance to antimicrobial agents
Neomycin	No proven value in the treatment of diarrhoea. Associated with gastrointestinal toxicity and may prolong or exacerbate the diarrhoeal episode. Promotes resistance to antimicrobial agents.
Hydroxyquinolines	Have not been shown to be effective for routine treatment of diarrhoea. Have been associated with severe neurological disorders.
Nonabsorbable sulfonamides	Lack of efficacy in the treatment of <i>Shigella</i> dysentery or other intestinal infections. There is concern about their toxicity.
ADSORBENTS	
Kaolin and pectin	Induce only a slight change in stool consistency. No evidence that they reduce the duration or severity of the diarrhoeal episode, or that they reduce the losses of fluids or electrolytes. May interfere with antibiotic treatment when indicated.
Activated charcoal	No evidence that it shortens the duration of diarrhoea, or that it reduces the number or volume of stools. As an adsorbent it may bind antibiotics or enzymes.
Attapulgit and smectite	No evidence that they have any effect on the losses of fluids and electrolytes. May bind or inactivate other drugs.

