

# Dialogue on Diarrhoea



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Continued feeding is essential for treating both acute and persistent diarrhoea.

## Persistent diarrhoea

Most episodes of diarrhoea are acute — they start suddenly and are quite short, lasting between two and seven days. Most are due to infections in the bowel. A proportion of acute cases, about one in ten, become persistent, lasting more than two weeks. Their importance is that they account for almost half of diarrhoea deaths. They also require extra treatment in addition to the oral rehydration therapy which is so effective for most cases of acute diarrhoea.

Chronic diarrhoea, which does not start with an acute infectious episode, may be due to a variety of metabolic or structural conditions or to parasitic infections. Chronic diarrhoea, which can often continue for months and years, is a different type of problem from persistent diarrhoea and is not considered in this issue.

### Clean and appropriate food

A most important aspect of the management of persistent diarrhoea is appropriate diet. This issue of *DD* concentrates on the linked themes of persistent diarrhoea and dietary management. It includes a report of an important WHO meeting and an article on the dietary management of diarrhoea.

### Lactose intolerance

Lactose or milk sugar, is the main carbohydrate source of energy for infants. Lactase, the gut enzyme required to digest and absorb lactose, is easily damaged by infections and malnutrition. How important is lactose intolerance, how is it diagnosed and managed? A number of readers have asked these questions to which *DD* replies on page 6. WAMC and KME

## In this issue:

- Persistent diarrhoea and dietary management
- Lactose intolerance
- Health Basics: Breastfeeding

## AHRTAG

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# WHO: Meeting report and guidelines

## WHO meeting on persistent diarrhoea in developing countries (WHO/CDD/88.27)

Children in developing countries may experience as many as ten episodes of acute diarrhoea per year. The vast majority of these episodes can be successfully treated with oral rehydration therapy (ORT) and continued feeding. Antibiotics should be used only for dysentery or suspected cholera. What is less certain is what to do if the diarrhoea does not stop. If diarrhoea lasts for more than two weeks (persistent diarrhoea) the effect upon nutritional status may be especially serious, and the chances of death increase as much as 20 times. Studies from various developing countries have shown that between three and 20 per cent of episodes of acute diarrhoea become persistent, and up to one half of all diarrhoea-associated deaths occur during episodes of persistent diarrhoea.

The World Health Organization held a meeting of paediatricians, epidemiologists, nutritionists and microbiologists to summarise current knowledge of persistent diarrhoea and define research priorities. Although many of the studies reported were incomplete, certain preliminary conclusions could be drawn.

### Risk factors

#### 1. Age

Persistent diarrhoea occurred most frequently during the first year of life when, in healthy infants, rates of growth and weight gain are most rapid.

#### 2. Malnutrition

Persistent diarrhoea causes more malnutrition than acute attacks. The mean duration of episodes of diarrhoea in malnourished infants was also longer than in adequately nourished children.

#### 3. Impaired immune defences

The risk of persistent diarrhoea was also increased by impaired immunity (as measured by skin testing). Presumably a healthy immune system is required to fight off gut infections. Measles and malnutrition, which can damage immunity, did not appear to be the cause of defective immunity in these studies.

#### 4. Previous diarrhoea

Children who had recently had an episode of acute diarrhoea or who had

ever experienced persistent diarrhoea were more likely to have persistent diarrhoea in future. This may be because of damage caused to the gut by the previous episode, or some other change in the child's defences against infection. Other infections do not predispose to persistent diarrhoea.

### 5. Specific gut infections

Infection with certain micro-organisms (especially *Shigella*, enteropathogenic *E coli* and, in malnourished children, cryptosporidium) appears to increase the risk of persistent diarrhoea. Increased numbers of bacteria which normally grow in the large intestine have been found in the small intestine of infants with persistent diarrhoea, but it is not known whether this abnormal colonisation caused the diarrhoea to go on longer.

### Treatment

Continued feeding is an essential part of the treatment of persistent diarrhoea, to counter the impact of persistent diarrhoea on nutritional status and maintain hydration. Persistent diarrhoea affects nutrition because of:

- decreased intake of food;
- impaired absorption of food;
- loss of nutrients from the body through the damaged lining of the intestine; and
- increased energy requirements because of fever or the need to repair intestinal damage.

### Food

Breastfed babies should continue to breastfeed during persistent diarrhoea. Children with persistent diarrhoea may be intolerant of animal milk because of their inability to digest lactose; this is most likely to be a problem when the child's diet consists entirely of milk from animals. Decreasing the lactose content of animal milk by the traditional method of yoghurt making may be beneficial in some patients. When this is not effective, soy milk, which contains neither lactose nor milk proteins, can be tried. For children above six months of age, weaning foods which are locally available, high in energy, low in bulk, nutritious and culturally acceptable, are recommended. Alternatively, a diet based on finely ground chicken may be tried. Vitamins such as A, folic acid and B12, and minerals such as zinc and iron may help the

repair process of the gut and boost immune defences.

### Rehydration

Hydration is maintained by giving extra drinks and ORS if needed. Very occasionally a child may fail to absorb glucose and require intravenous fluid.

### Antimicrobials and other medicines

Antibiotics are currently reserved for dysentery (diarrhoea with blood and pus in the stools). Use an antibiotic to which most *Shigella* strains in the community are sensitive. Studies are in progress to define more accurately the possible role of antibiotics for other specific infections in persistent diarrhoea, for example in enteropathogenic *E coli* infections, for which oral gentamicin may shorten the duration of the illness. Other drugs are of no proven benefit.

### Research priorities

Further research is required into all the areas discussed above, but the following were highlighted.

#### 1. Epidemiology

Community based studies are required to define the relationship of persistent diarrhoea to age, season, infectious agents, morbidity and mortality and to define risk factors for persistence.

#### 2. Infection and immunity

- Does the type of micro-organism present in the small intestine or stool culture during acute diarrhoea determine whether the illness will become prolonged?
- Is there a role for antibiotics and other drugs in the treatment of persistent diarrhoea?
- Can the risk of persistent diarrhoea be reduced by appropriate feeding and the use of cereal-based oral rehydration solutions, rather than standard ORS, during acute diarrhoea?

The death rate from acute diarrhoea can be cut by ORT. The next challenge is to reduce mortality due to persistent diarrhoea. It is hoped that the recommendations and research generated by this meeting will help to meet this challenge. A full report of the meeting was published in the *Bulletin of the World Health Organization* 66:709-717, 1988.

**Professor David Candy, Department of Child Health, King's College Hospital, London SE5 8RX, UK.**

## WHO Guidelines

### Nutritional management of persistent diarrhoea

There have been few studies of the dietary management of persistent diarrhoea, but experience in the nutritional therapy of acute diarrhoea, of chronic diarrhoea of infancy in industrialised countries, and of severe protein-energy malnutrition provides valuable guidance. Several clinical studies have shown that continued feeding during acute diarrhoea results in improved nutritional outcome and, in some cases, less severe diarrhoea. Although the benefits of continued breastfeeding in persistent diarrhoea have not been determined, it is recommended that breastfeeding be maintained during such episodes.

### Weaning foods

Studies during acute diarrhoea and experience gained in the rehabilitation of severely malnourished children show that weaning mixtures prepared from locally available foods are generally well tolerated. These food mixtures should be energy-rich, have low viscosity, and have low osmolality. In selecting a diet: complementary protein sources should be used; complex carbohydrates (starches) should be used to avoid hyperosmolality and reduce the problem of lactose maldigestion — e.g. milk-cereal mixtures are preferable to milk given alone; and fats that are most readily digestible should be preferred, especially as a means of increasing the energy intake. Giving small feeds more frequently during illness may help to maximise nutrient absorption.

### Vitamins and minerals

Folate, zinc, iron, vitamin B12, vitamin A, and possibly other micro-nutrients are involved in intestinal mucosal renewal and/or a variety of immunological responses. Supplementary vitamins and trace elements should be given during persistent diarrhoea, if possible.

### Milk from animals

Animal milk should not be routinely restricted during the treatment of acute diarrhoea. Nevertheless, in some infants with persistent diarrhoea, milk intolerance plays an important role in prolonging diarrhoea. This occurs mostly in infants who receive animal milk as the sole food. Reducing the amount of lactose in the diet can reduce the severity and possibly the duration of persistent diarrhoea.

### Convalescent feeding

Appropriate nutritional therapy during convalescence ensures that children return at least to their pre-illness nutritional state. Studies have shown that the desired level of energy intake (420–670J/kg/day) can be achieved by children who are given energy-rich (low bulk), low viscosity diets. This level of intake can promote a rate of growth far in excess of that expected for normal children of the same age group, thus achieving rapid nutritional recovery.

**CDD Update, No. 4, March 1989, WHO, Geneva**

## A source of faecal contamination

**Baby feeding bottles are a dangerous source of diarrhoea germs. Claudio Lanata reports from Peru.**

Several risk factors for diarrhoea have been identified and have been the focus of specific interventions to reduce diarrhoeal diseases. These include contaminated water, improper disposal of faeces, poor hygiene practices, and contaminated foods. In a recent study of 153 children living in a poor community on the outskirts of Lima, Peru,<sup>(1)</sup> in which we looked at the preparation and administration of weaning foods in the first year of life, an important vehicle of faecal contamination was identified: the baby bottle. The dangers of this must be emphasised because of the widespread use of feeding bottles in many developing countries where diarrhoeal diseases are endemic.

### Contrast with cups

The first clue came when microbiologic cultures were taken of foods given to children at different times during preparation. For example, teas, which were often given, beginning in the first month of life, had a low frequency of contamination immediately after heating (three per cent of 87 samples)<sup>(1)</sup>. If served in a cup, teas also had low levels of contamination at the time of consumption (two per cent of 49 samples). However, if served in baby bottles, a high frequency (31 per cent of 74 samples) were contaminated with faecal germs, most of them with colony counts of 10,000 or more per millilitre.

When several household articles used for food were cultured, the items most frequently contaminated with faecal coliforms were bottle nipples (37 per cent of 26 samples) and feeding bottles (23 per cent of 26 samples) when, according to the child's mother, these were supposed to be clean. In contrast, the mother's hands were less frequently contaminated (14 per cent in 78 samples) and the nipples of the mother's breasts very rarely (three per cent of 64 samples).

### Difficult to clean

This high level of contamination of bottle nipples and feeding bottles is most likely due to the difficulty in cleaning them in unhygienic environments, where water is scarce and expensive and usually contaminated, as is the case in this Peruvian community. Foods, such as animal milk, are contaminated by the bottles which also allow the bacteria to grow, especially if left at room temperature for more than one hour, as was documented in this study.

### Recommendations

The main conclusion is that the promotion of exclusive breastfeeding during the first four to six months of life will eliminate the feeding bottle as a source of faecal contamination during this period. But, because breastmilk is not sufficient by itself to satisfy the nutritional requirements of infants after this age, other foods must be introduced while continuing breastfeeding. These foods should be given using cups or dishes that are easier to clean and less likely than bottles to be contaminated. There is no need to use a baby bottle. The use of baby bottles should be completely eliminated. This will not only reduce the frequency of consumption of contaminated weaning foods, but will also help to maintain breastfeeding, resulting in a better infant diet.

### Reference

1. Black, R E et al. *Incidence and etiology of infantile diarrhoea and major routes of transmission in Huascar, Peru. Am. J. Epidemiol. In press.*

**Dr Claudio Lanata, Director General, Instituto de Investigacion Nutricional, Apartado 55, Miraflores, Lima, Peru**

# Persistent diarrhoea

## Appropriate dietary management

**Dr Roy and Dr Haider describe the relationship between persistent diarrhoea and malnutrition, and the types of food to give a child who has persistent diarrhoea.**

Persistent diarrhoea is a syndrome in which an acute episode of diarrhoea continues for more than 14 days. The causes of persistent diarrhoea are complicated, and relate to previous history of illness, diet, nutritional status and immune status. Management of cases of persistent diarrhoea may be difficult due to lack of diagnostic facilities, and absence of well defined guidelines for treatment. Many of these children have associated malnutrition, resulting from reduced food intake and/or loss of nutrients through diarrhoea. Nutrient loss may also be due to damage to the digestive system resulting from diarrhoeal infection, or malnutrition. In a recently completed study in Bangladesh, severe loss of nutrients was recorded in patients with persistent diarrhoea.

### Persistent diarrhoea and malnutrition

Since diarrhoea not only causes but also worsens malnutrition, a prolonged diarrhoeal episode has a more damaging effect on the nutritional status of the child. Severe deficiency of energy, protein and micronutrients often leads to kwashiorkor or marasmus in a child who is already undernourished. It is known that malnourished children have more problems of digestion and absorption, which may become worse during diarrhoea. Persistent diarrhoea is therefore a major cause of malnutrition and subsequent death. Prompt and effective intervention with an appropriate diet is a key factor in management of persistent diarrhoea<sup>(1)</sup>. Experience with persistent diarrhoea patients at the Inter-

national Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) treatment centre has helped us to develop some case management procedures that may be helpful for other countries. General management includes:

- correction of dehydration, and maintenance of hydration, with oral or intravenous rehydration solution;
- treatment of other infections, like acute respiratory infections, urinary tract infection, otitis media and other systemic infections which are present in many cases<sup>(2)</sup>;
- observation of the volume, consistency, and frequency of stool, preferably in a treatment centre.

A simple bedside test can be used for diagnosing carbohydrate malabsorption. If the stool pH is less than 5.5, and stool reducing substances are more than 0.5 per cent, carbohydrate malabsorption may be diagnosed.

### Choice of diet

Breastfeeding should be continued and encouraged in persistent diarrhoea patients. Proper choice of diet requires understanding the digestive capacity during persistent diarrhoea. Foods chosen should be easy to digest and absorb (to avoid osmotic effect), contain adequate nutrients, and be non-allergenic, energy-rich, and acceptable to the child. In selecting a diet:

- (i) complementary protein sources should be used;
- (ii) complex carbohydrates (starches) should be used to avoid hyperosmolality and reduce the problem of lactose maldigestion — e.g. milk-cereal mixtures are preferable to milk given alone; and
- (iii) fats that are most readily digestible should be preferred, especially as a means of increasing energy intake.

Foods used should also be available, not too expensive, and culturally acceptable. Children with persistent diarrhoea are very often anorexic and dietary management of these children may be difficult at the beginning. This can be overcome in most cases by giving frequent small feeds during the first few days.

In the developed countries, a wide range of commercially available prepared diets is available, but there are only a few in developing countries (and  
*Continued on page 5*



ICDDR,B

Management of persistent diarrhoea includes correction of dehydration with ORT.

Continued from page 4

these are usually expensive). The reduction of usual lactose content in milk formula for children whose sole source of protein is milk may sometimes help to resolve diarrhoea. If reduction of the lactose content in cow's milk (by providing mixtures containing milk and staple food products, or by decreasing the lactose in animal milk — for example by traditional fermentation) does not bring any improvement, the next step in management would be to give a milk-free diet using soya based formula, or a cereal based diet. Recently at the ICDDR,B a cereal based liquid formula made with inexpensive, locally available ingredients (rice powder, soya oil, glucose and egg protein) has been used successfully. Eighty one per cent of patients over three months of age improved within five days. Another milk-free diet prepared with rice-dal (lentils) mixture has also been used successfully in India.<sup>(3)</sup>

### Severe cases

Most children respond to this dietary regime. However a small proportion of children with severe persistent diarrhoea (high stool volume and marked weight loss) may require specialised treatment in hospital and further modified diets, like a comminuted (finely chopped) chicken diet. Though it is efficient for management of severe cases, this diet is too expensive and difficult to prepare at home for most people in developing countries.

Patients who fail to respond to the



Asem Ansari/ICDDR,B

Continued feeding prevents the malnutrition which can result from persistent diarrhoea.

reduction of the lactose content of the diet, and cereal based or comminuted chicken diets can be given a commercially available casein hydrolysate formula, 'Pregestimil' (Mead Johnson and Co). If there is no improvement in diarrhoea a week after the introduction of these diets, other underlying causes of diarrhoea should be investigated. These include small bowel bacterial overgrowth, severe enteropathy, monosaccharide intolerance and organic disorders. Most children will respond to specific dietary and/or antimicrobial therapy. However, some with very severe food intolerance, will be unable to take food orally and will have to receive intravenous alimentation for several days or weeks, before

progressive amounts of readily absorbable nutrients can be administered orally.

If the diarrhoea stops with any of the above mentioned diets, continue with the same diet for a minimum of two weeks. Subsequent follow-up at weekly intervals is necessary to monitor growth and the gradual transition to normal foods.

Vitamin A, folic acid and zinc should be given routinely as these patients are usually deficient in these essential micronutrients.

Although persistent diarrhoea is a challenging problem, when treatment is based on appropriate nutritional therapy, the results can be very encouraging.

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**R Haider (Research Physician) and S K Roy (Associate Scientist), International Centre for Diarrhoeal Disease Research, Bangladesh, GPO Box 128, Dhaka 1000, Bangladesh**

### Composition of diets used in persistent diarrhoea (/litre)

#### Half strength rice suji

Rice powder	30g
Egg albumin	15g
Oil (soya)	20ml
Glucose	25g
Potassium chloride	1g
Sodium chloride	1g
Magnesium chloride	0.5g
Calcium chloride	1g
Water up to	1l

<b>Energy</b>	400 kcal
<b>Osmolality</b>	280 mosmol/kg

#### Half strength comminuted chicken

Chicken, minced	90g
Oil (coconut, soya)	20ml
Glucose	30g
Potassium chloride	1g
Sodium chloride	1g
Magnesium chloride	0.5g
Calcium chloride	1g
Water up to	1l

<b>Energy</b>	380 kcal
<b>Osmolality</b>	218 mosmol/kg

# Questions and answers

## Lactose intolerance

I work in a teaching hospital in Orissa, south east India, where treatment of diarrhoea and its complications demands a large share of my time. I am concerned by the increasing incidence of lactose intolerance, particularly in malnourished children. It is essential to give milk to these babies to break the vicious circle of diarrhoea and malnutrition, and using soya milk is very costly. It is very distressing that we are sometimes forced to stop even breastmilk temporarily due to the severity of the diarrhoea. I would very much like to know if it is possible to obtain lactase, which seems to be the ultimate solution to this problem.

**Dr P Suvarna Devi, Assistant Professor, Dept of Paediatrics, M K C G Medical College, Berhampur 760 004, Orissa, India**

Acute gastroenteritis sometimes leaves young infants with secondary complications such as malabsorption and malnutrition. It is necessary to stress good dietary advice so that the child does not develop malnutrition. Breastfeeding is most important in this situation.

Some infants develop varying degrees of lactose malabsorption. Very few have a total lack of lactase in the gut warranting elimination of lactose until such time as the gut mucosa returns to normal. Some develop a moderate degree of lactase insufficiency that requires short periods of withdrawal and gradual reintroduction of breastfeeds. The majority of children will have a mild degree of insufficiency. They do well with alternating breastfeeding with a lactose free cereal diet. The danger of permanent discontinuation of breastfeeding should be prevented by proper education. The value of lactose free cereal diets made of locally available grains needs no emphasis.

The role of drugs in inducing lactose

deficiency should be remembered before prescribing them. There needs to be a balanced approach to dietary management during diarrhoea. One cannot be so particular about breastfeeding in the presence of severe lactose malabsorption. On the other hand, prescribing lactose free formulas, even for trivial intolerance, is not warranted. It is better to use cereals and pulses as the best supplementary foods in diarrhoea with lactose intolerance.

**Dr P Natarajan, Aswini Hospital, Villupuram 605 602, India**

## DD replies

*Lactose*, or milk sugar, is a disaccharide carbohydrate and an important constituent of both human and other milks. In the small bowel this is split by the enzyme *lactase*, on the surface of the enterocytes, the cells lining the small bowel, into the monosaccharide sugars, glucose and galactose (see Figure 1). Malnutrition, bowel infections and certain drugs can damage the lining cells so that the amount of lactase is reduced. This condition in children is called *acquired* or *temporary lactase deficiency*. When someone with lactase deficiency has a lot of lactose sugar in the diet, the bacteria in the bowel act on the sugar breaking it down into short chain acids. These both irritate the bowel and limit absorption so that stools become acid and watery (see Figure 2). This may be associated with abdominal discomfort and extra flatus (wind). Many individuals, including most adults, and some racial groups in particular, are lactase deficient. It almost amounts to physiological lactase deficiency of adults. Most of them can and do tolerate some lactose as milk in the diet.

Health workers are more conscious about lactose intolerance because of the small proportion of diarrhoea cases where this deficiency causes problems. Also some artificial milks contain extra added lactose and this puts stress on the sugar splitting enzyme system. Some baby food companies are promoting lactose-free or low-lactose milk substitutes as the answer to the question "what nourishment should I give my child who has diarrhoea?"



For infants with acute diarrhoea with temporary lactose intolerance, breastfeeding should be continued.

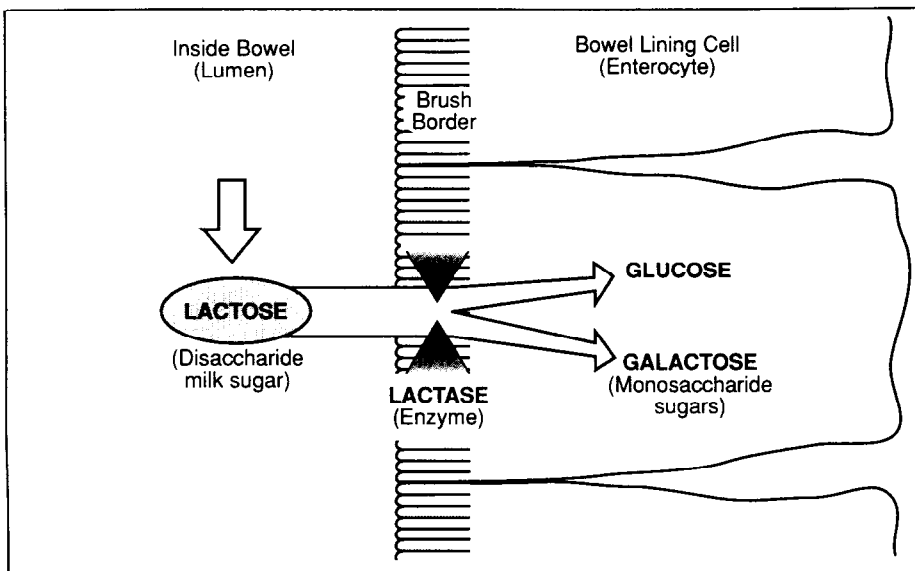


Figure 1: Normal digestion and absorption of lactose.

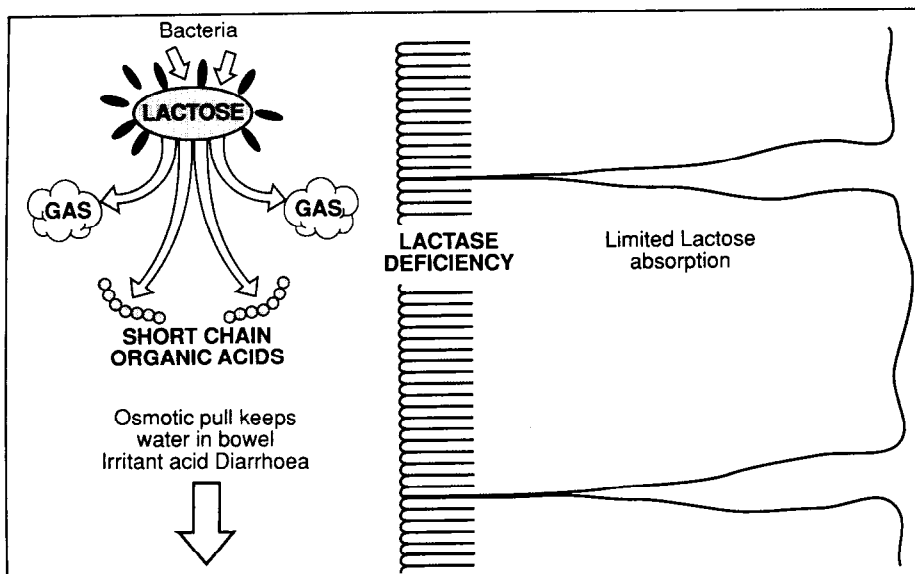


Figure 2: Results of dietary lactose when lactase is deficient.

### How do you know if a baby really has lactose intolerance?

1. Test the stool with a blue litmus paper which turns pink at about pH5.5-pH6. Dip the paper in the liquid stool and look for the colour change. The most likely cause of an acid stool is lactose intolerance. This is a screening test rather than definite proof of diagnosis.
2. Test for reducing sugars in the stool. Use a "Benedict-test" system. "Clinitest" is the most widely available and convenient form. Five drops of a freshly collected liquid stool are diluted with 10 drops of water in the little test tube. A "Clinitest" tablet is added and

the mixture will heat up and froth. Check the colour of the fluid against the chart provided. An orange-brown colour indicates >0.5 per cent of reducing substances. This is very suggestive of carbohydrate malabsorption.

3. Milk withdrawal and challenge. The two tests described above check for the presence of lactose intolerance, but do not reveal whether it is clinically important. Many infants with acute infectious diarrhoea have temporary lactose intolerance that is *not* clinically important. They do not require any change in diet even when the above tests are positive. The clinical importance of lactose intolerance can best be determined by checking whether diar-

rhoea rapidly worsens when milk is given, and rapidly improves when milk is temporarily replaced by a cooked cereal or other lactose-free food. Dietary changes to reduce the amount of lactose are only needed when lactose intolerance is clinically important.

### Managing clinically important lactose intolerance in infants

Remember that in most cases in infants the intolerance is only partial and temporary. Once the cause is remedied, the infection has settled or the malnutrition recovered, the new cells will make lactase again.

The steps described below should be taken in sequence. Try each for two or three days. If diarrhoea has not improved, move to the next step.

1. Dilute cows' milk or formula milk to half strength. Make up the milk in the usual way and then add an equal volume of clean drinking water. This will dilute any lactose along with other components of milk. Give extra cereal pulse mixtures to make up the nourishment requirements. This is not appropriate in the first four months of life (see letter from Dr Natarajan). (Note — pulses are leguminous vegetables, peas, beans, dhal, gram, etc.)

2. Replace milk with milk products which are modified in traditional ways, e.g. as curds or yoghurt, and therefore have a reduced lactose content.

3. Withdraw milk completely for a few days. Breastmilk should only be withdrawn as a last resort. Ask the mother to express her milk to keep up production as her baby will need it again in a few days time. Give cereal pulse mixtures as suggested above, or use a soy-based milk substitute for infants below four months of age.

**Note** Lactase-like enzymes can be recovered from a variety of vegetable and animal materials, e.g. yeast. However, the pure forms, suitable for converting the lactose of milk for food, are very expensive so this is not a realistic alternative to soya milks. (See question in letter from Dr Suvarna Devi).



## Students as communicators

During a recent epidemic of diarrhoea in our state the Indian Medical Association obtained a donation of two tons of glucose, plastic packing material and printed instructions. We organised college, high school and technical school students throughout the state to prepare more than 800,000 small packets of ORS using a simplified formula with glucose and sodium chloride. The students then distributed the packets house to house, providing the product and a message on how local fluids could also be used to prevent the dangerous dehydrating effects of diarrhoea. The project grew and was undertaken in all major cities and rural areas of Sadvichar Parivar, a state of more than 30 million. Lions, Rotary, Jaycees and women's groups joined in as well. Students were highly effective communicators, often mixing the solution and drinking it in public to create confidence. Widespread community acceptance was evident and we are proud that while many other states clamoured for cholera vaccine, our communities were effectively educated to the use and effectiveness of ORS in diarrhoea.

**Dr P Mehta, Honorary Secretary, IMA College of General Practitioners, Gujarat, India**

## Combining beliefs

Much health communication misses its mark because health workers unquestioningly translate health messages from English, French or other languages directly into the local language. While the words themselves may translate, the ideas behind them often get lost, because local cultural disease perceptions do not always relate to modern scientific ideas. The solution is not to revert totally to local explanations of the disease process, but to find some common ground between different medical and cultural ideas. This process can best be achieved during discussions between the health

worker and small community groups. This example of the Yoruba people in south west Nigeria illustrates the point. *Oka ori* is the Yoruba name for sunken fontanelle. It is thought to be a disease in its own right. The Yoruba are not unique in this belief, as it has been documented in other parts of Africa and in Latin America. The disease is not associated with diarrhoea but is thought to be caused by certain foods eaten by the mother during pregnancy. The health implications of this local belief are that moderate to severe levels of dehydration may not receive timely life-saving attention.

To tackle the problem, the health worker can begin discussion by asking questions about recognition, cause, treatment, and prevention of *oka ori*, listening and noting local ideas on each issue. While doing this, the health worker should keep in mind modern ideas about dehydration and look for a bridge between the ideas.

**William R Brieger, MPH, African Regional Health Education Centre, Department of Preventive and Social Medicine, University of Ibadan, Nigeria**

## ORS and Vitamin A Deficiency

Having worked for the last three years in an eye hospital in the south east flatland of Nepal, I would like to share some findings and experiences. Night blindness and clinical signs of Vitamin A deficiency (VAD) are found in six per cent of all children aged up to ten years in our area. (Survey of 70,000 children checked at their homes in 1988.) Malnutrition and diarrhoea are the main contributing causes of VAD. In the hospital, forms are also filled out about the history of illnesses and food habits of VAD children.

Ninety per cent of the children with corneal lesions had had diarrhoea recently, or were still suffering from diarrhoea. Most of them were seen by a doctor before they came to us, because of illness and diarrhoea. Most were

given ORS but nutritious foods like bananas, yoghurt, papaya (traditional foods to give in diarrhoea) were forbidden — only some rice was allowed. Nearly all the children had already developed eye problems (at least night blindness), but were not given vitamin A capsules, although antibiotic eye drops were sometimes given by the doctor. Parents gave their children ORS and some rice while diarrhoea continued for one to two weeks. The eye conditions became worse, the children did not open their eyes, and then they came to the eye clinic.

ORS is saving children's lives, but not their sight, in our area. ORS is advertised in Nepal as a medicine: 'medicine water' or 'salt-sugar water', so many people think that other food or treatment is not needed . . . I think that in countries where VAD is still a big problem, brief information on ORS packets could help to prevent blindness, for example, about looking for eye changes and giving vitamin A capsules and nutritional advice specific for each country. What do you think?

**Cordula Ran, Lahan, c/o United Mission, P O Box 126, Kathmandu, Nepal**

**Editor's note:** This sounds like a very good idea. What do other *DD* readers think?

## Involvement of other professionals

I wish to air my views on the involvement of other professionals besides nurses and doctors in education about and administration of oral rehydration therapy. These could include public health inspectors, primary school teachers and voluntary social organisations. The rate at which knowledge of ORT is spreading within our community is not encouraging, hence the need for programmes to give a role to non-health personnel.

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