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Dialogue on Diarrhoea

The international newsletter on the control of diarrhoeal diseases

Diarrhoea and dire circumstances

Epidemics of diarrhoea are a still a major problem. People living in refugee camps, who have been recently displaced by war or natural disasters, are especially at risk, because they do not initially have access to clean water supplies and good sanitation. Diarrhoeal diseases, such as cholera, can spread rapidly among adults and children in refugee camps. Those who live in overcrowded shanty towns, where environmental conditions are poor, are also vulnerable.

As the *Dialogue* goes to press, reports highlight the risk of diarrhoeal diseases in Iraq, in areas where sanitation infrastructure has been destroyed. This year, for the first time this century, cholera has broken out in Latin America. The epidemic is spreading rapidly, affecting several countries and large numbers of people.

Cholera need not kill

Correct use of oral rehydration therapy (ORT) and appropriate drugs will save most lives. Fewer than one per cent of over 200,000 reported cholera cases in Peru have died, because prompt action has been taken[1]. After the first case was identified, health authorities made sure that medical staff throughout the country knew how to treat cholera, and hospitals were issued with special supplies of ORS, intravenous fluids and antibiotics. Public health education is ensuring that people know how to recognise cholera and help prevent its spread.

This issue of the *Dialogue* describes public health measures to control cholera, and reports on how cholera deaths were dramatically reduced in a rural area of Bangladesh and a refugee camp in Malawi. A special supplement features practical guidelines on preventing diarrhoea epidemics in newly established refugee camps.

Finally, most people know that diarrhoea germs can be passed from one person to another, or through contaminated water. Fewer know that it is possible to catch an infection that causes diarrhoea from animals. Find out more on page 4.

C. Gaggero/WHO/PAHO

Epidemics of diarrhoeal diseases, such as cholera, can spread rapidly where environmental conditions are poor, especially in shanty towns or refugee camps.

1. Lores H, and Burbano J, 1991. Cholera situation in the Americas. Epidemiological Bulletin, PAHO. Vol 12, no.1.

In this issue:

AHRTAG
Appropriate Health Resources & Technologies Action Group Ltd

Epidemic control

DD describes public health measures which help to prevent the spread of cholera.

The current cholera epidemic is caused by the El Tor vibrio organism, which was first seen in 1961 in Asia. The pandemic spread to the Middle East and reached Africa in 1970. Nearly 100 countries have been affected. Traders and travellers can carry the infection without knowing, and large gatherings of people increase the chance for infection to spread. Cholera epidemics have also occurred in many refugee camps in recent years (Ethiopia in 1984-85, Sudan in 1985, Somalia in 1985 and Malawi in 1986-88).

The cholera epidemic that began early this year in Peru is now very serious. It has reached the capital, Lima, where more than half the city's population of seven million live in shanty towns. The epidemic has already spread to other Latin American countries. In Africa, Zambian authorities had, by March, reported 6,000 cases, in an epidemic that also threatens neighbouring Tanzania.

Being prepared

During an epidemic, most cholera episodes are mild and many people can carry the organism but show no symptoms. Severe cholera is characterised by frequent watery stools and vomiting. Fluid losses are high, and dehydration can develop rapidly, resulting in death within three to four hours of the symptoms first appearing. Patients may also be weakened by having to travel long distances to health facilities, and these facilities are often unable to cope with the sudden increase in numbers of people needing care. In an unprepared community, severe cholera can be associated with death rates of 50 per cent or more.

However, cholera is treatable. In most cases ORT and an appropriate antibiotic are sufficient. Even in severe cases, correct treatment can reduce death rates to less than one per cent of those infected. Cholera can also be prevented, but this requires improvements in water supply, sanitation and hygiene.

National diarrhoeal disease control programmes, if properly organised and managed, can reduce the spread of infection by ensuring that the health system is well prepared to quickly detect and control an epidemic. This includes monitoring patterns of illness, and training health workers to cope with an increased caseload and to manage cases correctly.

Increased publicity about the value of correct case management, including ORT, during a cholera epidemic could, in the long term, improve acceptance of similar treatment for those with diarrhoea due to other causes.

Common sources of cholera infection

- water contaminated at its source (e.g. by faeces leaking into an incompletely sealed well) or during storage (e.g. by contact with faecally contaminated hands)
- contaminated foods which are eaten raw or undercooked, or stored at a temperature at which bacteria can rapidly multiply to infectious levels
- raw vegetables that have been washed with contaminated water

Control measures

If an epidemic occurs, local authorities should emphasise the following preventive measures:

- provide/maintain safe and adequate community facilities for excreta disposal;
- supply clean drinking water, if possible, if the existing supply is contaminated;
- prevent the use of contaminated drinking sources or washing/bathing areas;
- provide suitable chemicals for, and information about, household water purification;
- discourage the gathering of large crowds, for example, at feasts or funerals;
- ensure immediate and hygienic disposal of dead bodies.

They should also take measures to ensure effective treatment of cases:

- establish emergency treatment centres, assure a supply of essential materials for treatment of patients, and retrain medical personnel if necessary;
- identify and treat patients early, isolate them from others as far as possible, and promptly disinfect their surroundings (e.g. bedding, drinking vessels).

Pat Diskett

Temporary treatment centres reduce pressure on health facilities during an epidemic.

Public education

Health workers need to inform the community about how to avoid infection. Families will be worried and looking for help and advice: individual home visits, posters, public meetings and radio and TV announcements may all be appropriate. Community and religious leaders can also help to mobilise people to take part in epidemic control activities.

These are the most important points to emphasise:

- With correct and prompt treatment, cholera is not fatal.
- Most cases can be treated with simple measures, especially ORT.
- Dispose of human excreta safely.
- Good personal hygiene habits help prevent transmission of cholera.
- Safe preparation of food and cleaning of utensils reduce risk of infections.
- Use clean water for drinking and bathing.

What *not* to do when cholera breaks out:

- Vaccination is not recommended. This is because the vaccine gives only modest protection, which disappears after several months. Two injections are required, separated by at least two weeks.
- Mass chemoprophylaxis (preventive dosing with antibiotics) is not helpful, since it is usually impossible to treat everybody quickly enough to prevent the infection spreading. Occasionally it is appropriate to dose close contacts of cholera cases (see case study 1).
- Travel restrictions are not effective in preventing the spread of infection. This is because many people are symptomless

carriers of the cholera organism, but are still able to infect others. It is not possible to control the movements of such apparently healthy persons.

- Trade restrictions are not effective. There is no evidence that restricting exports from areas where cholera is occurring will prevent it spreading to unaffected areas nearby.

Ref: WHO guidelines for the control of epidemics due to cholera (1991). WHO's information kit on cholera provides more information on how to organise activities during an outbreak, and how to identify and treat cholera patients. Available from the CDR Programme, WHO, 1211 Geneva 27, Switzerland.

Case study 1: Cholera control in a refugee camp

Factors that led to the rapid spread of cholera in a Mozambican refugee camp in Malawi were identified by a research study. The study monitored cholera incidence, identified high-risk groups, and led to precise recommendations that helped to bring the epidemic under control. Through following these recommendations, the cholera incidence rate was kept to below three cases per 1,000, despite the extremely poor general health of the refugees.

Between 15 March and 17 May 1988, 784 cases of cholera were registered at the cholera treatment centre which had been set up in the camp. A case-control study of the first 50 cases brought to the centre, showed that those with cholera were more likely to have used water from one of the shallow wells in the camp than the healthy individuals in the control group.

Rains had destroyed half the camp's latrines two weeks before the epidemic broke out. Most of these latrines were three to four metres deep and in contact with the water table (the water level beneath the ground), which was at most only four metres below the surface. This water was contaminated by latrine contents during the rains, and caused surface well water to become unsafe. Nearly half of the shallow wells in the camp tested for faecal coliform bacteria showed positive signs of faecal contamination, whereas none of the deep borehole wells did.

After the study, camp authorities advised the refugees to use only the boreholes as far as possible. Families were also supplied with chemicals to chlorinate their drinking water.

Limiting transmission

The market was also temporarily closed, since the study found that those with cholera were more likely to have eaten food recently bought there. The twice monthly food distribution, normally held in one central area, took place instead at a number of different parts of the camp, to discourage the gathering at one site of thousands of refugees from both outside and within the camp.

The cholera treatment centre kept records of where cholera patients lived in the camp, so that areas of high risk could be identified. Health workers found new cases through home visits, so that oral rehydration treatment could be given early in the illness. Preventive doses (prophylaxis) of tetracycline (250mg tablets four times a day for three days) were given to family contacts of cases. Supervised by health workers, the bodies of those who had died were disinfected with chloride of lime, and put into sealed plastic bags for burial.

Moren, A, et al. 1991. Practical field epidemiology to investigate a cholera outbreak in a Mozambican refugee camp in Malawi. J. Trop. Med. Hyg., 94:1-7.

Case study 2: An emergency treatment centre saves lives

Temporary treatment centres help to ease the pressure on health facilities during an epidemic. One such centre was set up during a cholera outbreak in a rural village in Bangladesh in 1986, because the nearest permanent health centre was three hours away by boat. Local community leaders made a primary school shed available as a temporary centre, which was kept open for three weeks, catering for over 200 patients.

One doctor, with three assistants, provided medical care; relatives of patients and unqualified local practitioners provided day-to-day care and food. Drugs and treatment supplies included only ORS, intravenous saline bags and tetracycline capsules. A government health inspector monitored the epidemic, by organising household surveys and obtaining detailed histories from patients at the centre.

After the centre was set up, the numbers of reported cases and of patients receiving medical attention trebled. The proportion of deaths dropped substantially, from 14 per cent to 0.4 per cent, with only one death out of the 263 reported cases. Most patients were able to reach the centre before their condition became life-threatening, and prompt and effective rehydration treatment saved many lives. Before the centre opened only one case out of 94 had managed to get to the permanent health centre, and all 13 fatal cases had died at home. The success of ORT in saving lives at this centre should help to persuade local health workers and the community of the value of ORT in diarrhoea management.

Siddique, A K, et al. 1990. Makeshift treatment centre during a cholera epidemic in Bangladesh. Tropical Doctor, 20: 83-85. Correspondence to Epidemic Control Preparedness Programme (ECPP), ICDDR,B, PO Box 128, Dhaka 1000, Bangladesh.

How to recognise and treat cholera

Health workers should look out for the first signs:

- an increase in the daily number of patients with diarrhoea and vomiting, especially those with 'rice water stools';
- watery diarrhoea causing severe dehydration in any patient aged ten years or more.

Case management:

- give ORS solution to the patient by mouth. The amounts below show *approximately* how much ORS solution to give during the first four hours of treatment:
  - under 4 months – 200ml to 400ml
  - 4-11 months – 400ml to 600ml
  - 1-4 years – 600ml to 1200ml
  - 5-14 years – 1200ml to 2200ml
  - over 14 years – 2200ml to 4000ml
- give Ringer's Lactate Solution intravenously if severely dehydrated;
- feed the patient three or four hours after ORT has been started, and when rehydration is completed, continue to encourage him or her to eat and drink – infants should continue to breastfeed;
- treat severe cases with an appropriate oral antibiotic, such as tetracycline, when vomiting has stopped (usually within a few hours of beginning ORT). Adult dosage: 500mg tetracycline 4 times per day for 3 days *or* 300mg doxycycline in a single dose. Where there is local resistance to tetracycline, give 100mg furazolidone 4 times per day for 3 days, *or* 160mg TMP and 800mg SMX twice a day for 3 days. (See page 7 for child dosages.)

A danger to human health?

Most health workers are aware of person-to-person transmission of diarrhoeal disease. The fact that animals can transmit diarrhoea germs to people is less well known. *DD* reviews the evidence.

Micro-organisms that cause diarrhoea are found in many domestic animals and birds, which live with people as food sources or pets. These include cattle, goats, pigs, dogs, cats and chickens. Wild animals, such as rats, that live in the same environment as people, also act as hosts for these organisms.

There are two ways in which these micro-organisms can be transmitted to people. Animal products, such as chicken meat, eggs or milk, can be contaminated with bacteria. People consuming these products risk diarrhoeal infections. This article focuses on the second route of transmission of infection, which takes place via animal faeces.

Many species of bacteria, viruses and protozoa have been found in the intestines of healthy animals. These include common causes of diarrhoea such as *Campylobacter, E. coli, Salmonella,* rotavirus, cryptosporidium, *E. histolytica* and giardia.

The species, age and health of animals determines the extent to which they act as organism hosts. A study in Haryana state, India showed that on average only 10 per cent of a mixed group of sick and healthy buffalo and cattle tested positive for *Campylobacter*[1]. Young animals, and those with diarrhoea, were more likely to have *Campylobacter* in their stools than healthy adult animals. In contrast, 50 per cent of all the pigs tested had *Campylobacter* in their stools, including the healthy ones. Ten per cent of children tested in the same area also had the bacterium in their stools.

In developing countries, diarrhoeal diseases mostly affect young children, and those who live in rural areas usually have more infection from animals than urban dwellers.

Contaminated environment

Transmission from domestic animals is probably an important source of infection. It usually occurs through contamination of the household environment by animal faeces. In addition, food and drink can transmit infection to humans when they have become contaminated by animal faeces.

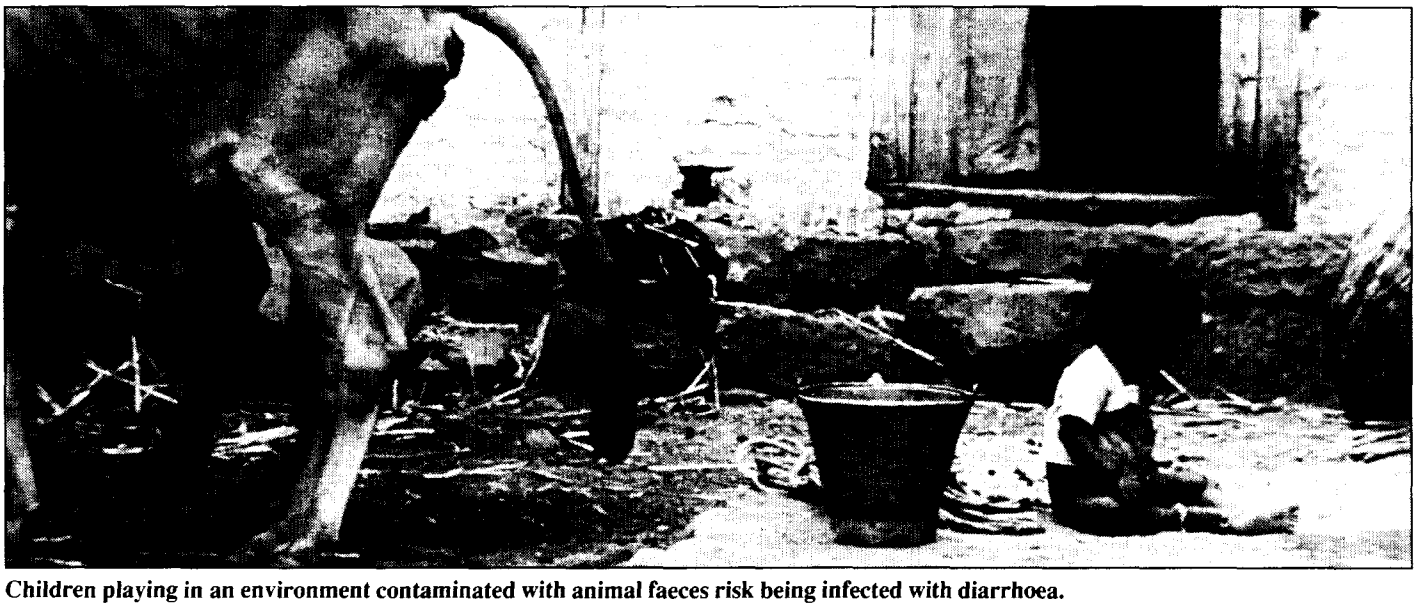
Diarrhoea-causing organisms are transmitted to humans from animals very easily through the faecal-oral route. An infectious dose of *Campylobacter*, for example, can be as low as one hundred organisms. Animal faeces can come into contact with and contaminate children's playthings, cooking utensils, bedding, and garden soil or yard dirt. Children playing in, and touching things in an environment contaminated with animal faeces will get traces of faecal matter on their fingers and hands, which they often put into their mouths. They are also likely to contaminate other objects with their hands.

Any health education programme aiming to reduce diarrhoeal disease in a community should consider the possibility that animals may be a source of infection.

The following are suggestions for reducing the health risks of living with animals:

- maintain good animal health; isolate sick animals, treat them appropriately (see article on page 5 on ORT for animals with diarrhoea) and keep children away from them, if possible;
- keep animals away from drinking water sources used by people;
- keep stray animals out of the household area;
- sweep up and either bury animal droppings, or put them in a latrine, or place them on a dung heap that is inaccessible to children;
- keep children's play areas separate from where animals are kept;
- keep smaller animals such as chickens off surfaces where food is prepared, and out of kitchens and eating areas as far as possible;
- do not allow animals to eat off the same dishes as people;
- make sure that children wash their hands, preferably with soap, before eating or touching food, especially if they have been playing with or near animals.

1. Kakkar et al, 1990. Prevalence of campylobacter infections in animals and children in Haryana, India. J. Diar. Dis. Res. 8:34-36.



UNICEF New Delhi

Children playing in an environment contaminated with animal faeces risk being infected with diarrhoea.

Chickens and childhood diarrhoea

Diarrhoea is a major health problem for young children in Peru. Contact between toddlers and domestic chickens may be a cause of infection. *DD* reports.

A study in Lima's shanty towns looked at the factors which might explain the patterns of transmission and infection with the bacterium *Campylobacter jejuni*. Earlier research had shown that:

- chickens often carry *C. jejuni* in their gut;
- *C. jejuni* causes much of the dysentery seen in infants in Lima;
- *C. jejuni* can survive for up to 48 hours in chicken faeces: 40 per cent of samples from infected chickens contained active *C. jejuni* after 24 hours in the sun, and after 48 hours 18 per cent were still positive;
- children in families where household chickens were infected with *C. jejuni* were 12 times more likely to have diarrhoea than those in homes without chickens.

Children's habits

Field workers visited ten homes with children under five years of age (a total of 21 children). They observed the behaviour of these children and of chickens for 12 hours in each home and saw that:

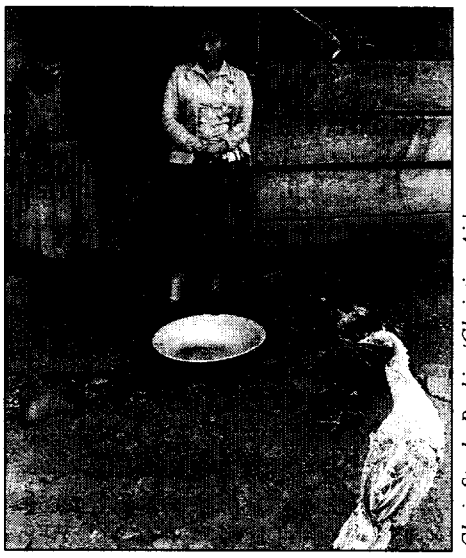
- each child touched chicken faeces with his or her hands about three times;
- each child put fingers contaminated with faeces in his or her mouth about four times;
- contaminated hands were rarely washed before the child sucked his or her fingers;
- the likelihood that a child's fingers would be contaminated increased with the number of chicken stools deposited in the home during the day.

Mothers knew the risks, but ...

As part of the study, 108 mothers were asked about their poultry rearing practices and beliefs. Most (71 per cent) were aware that it cost less to buy a chicken in the market than to raise one at home, but they continued to keep chickens for reasons of enjoyment.

Nearly half of the mothers who kept chickens knew that free-roaming poultry are a health or hygiene risk. Nevertheless, in 83 per cent of families, the chickens were allowed to roam freely and had access to the house. This was possibly because of the commonly held belief that chickens grow better if allowed to wander freely.

These findings show that even when people know about the health risks of certain practices, other factors may decide their behaviour. Behavioural and cultural studies like this can help us to understand better how diarrhoeal diseases are transmitted. Health education workers need to know what is happening in the home, otherwise their efforts to improve hygiene may be inappropriate and ineffective.



Chris Steele-Perkins/Christian Aid

In Peru's shanty towns, chickens roam freely despite the health risk.

Marquis, G S et al, 1990. Faecal contamination of shanty town toddlers in households with non-corralled poultry, Lima, Peru. Am. J. Public Health 80:146-149.

This study was supported by the Applied Diarrhoeal Disease Research Project of Harvard Institute for International Development, 1 Eliot Street, Cambridge, MA 02138, USA.

ORT for animals

Diarrhoea often affects young domestic animals, such as calves and piglets. But ORT can be given to animals as well as to people.

The idea of ORT for animals is not as strange as it first sounds. Diarrhoea in animals is caused by bacteria and viruses similar to those that affect humans. Animals with diarrhoea suffer the effects of dehydration and loss of salts in much the same way as people. Dehydration from diarrhoea is the main cause of death in young animals, with death rates of 20 to 30 per cent or more. A loss of six to ten per cent of body weight produces clinical signs like those seen in humans.

The loss of livestock through diarrhoeal disease can be a great economic problem for farmers. It can be prevented by keeping young animals in clean, uncrowded surroundings, feeding them with colostrum, weaning them gradually, and avoiding stressing them during transportation.

Before ORT was discovered, the only treatments available were intravenous rehydration and antibiotics. Studies during the past twenty years show that ORT can reduce mortality in animals to two per cent or less, and that antibiotics are ineffective. Pig co-operatives in Haiti are now using ORT, which is important because the North American breeds introduced in the 1980s are particularly susceptible to diarrhoea. Animals will drink ORS eagerly from an open container, or from feeding bottles. Very weak animals need a stomach tube. The composition of fluids used is similar to the WHO formula.

Animal immunisation programmes have helped to improve community acceptance of vaccines for young children. This suggests that ORT promotion for animal use might encourage people to give ORT to their children. It would be useful, however, to have more first-hand accounts about ORT for animals. Perhaps health workers could try to give ORS to animals with diarrhoea – if you have already done this, please share your experience with other readers!

Dr Norbert Hirschhorn, c/o The Ford Foundation, PO Box 2030, Jakarta 1001, Indonesia.

Ref: Gastrointestinal diseases in the young pig and calf. 1983, Ann. Vet. Res. (whole issue) 14: no 4.

What changes behaviour?

Richard Laing reviews the effectiveness of different methods used to change prescribing practice.

Over-prescription of drugs is a major problem in patients with diarrhoea. Various strategies have been used to try to improve prescribing practices. The results have often been disappointing. This article looks at the methods used, and which seem to work best.

Methods available

TALC

Approaches to changing practice can be grouped into four categories.

• **Educational** – This is the most common approach, but can be the least effective. It usually takes place during basic undergraduate training or through in-service activities. The most successful educational methods are 'face-to-face', such as small group teaching, one-to-one training, or advice giving at the time of dispensing. Printed educational materials are most effective when combined with other interventions. General media, for example national or local newspapers, radio or television, are useful for quickly spreading new information.

• **Regulatory** – These are related to government policy or laws. These include banning particular drugs; limiting the number of drugs available to lower level health facilities; preventing repeat prescriptions; or limiting the number of drugs which a doctor can prescribe. Unfortunately, these actions can have unexpected, negative results. For example, if an ineffective but harmless anti-diarrhoeal drug is banned, doctors may prescribe another more dangerous drug in its place, rather than giving only ORS.

• **Managerial** – These are related to health system administration. These include limiting drug availability by changing the national drug list; restricting the prescribing of certain drugs to doctors with special training; altering prescribing and dispensing patterns by encouraging the use of standard prescription forms, and diagnostic and treatment guidelines; printing clear instructions on drug container labels; and regularly monitoring prescribing practices.

• **Financial** – These are related, for example, to reducing the profit margin on non-effective drugs, or making essential drugs less expensive.

Small group teaching is one of the educational methods that has successfully changed prescribing practice.

Which methods work best?

Apart from one study in Yemen[1], there has been very little evaluation of efforts to improve prescribing practices in developing countries, and therefore not much is known about what does and does not work. In the Yemen study two different areas were compared, one with a functioning essential drugs programme, and one without. Compared with the non-programme area, the number of essential drugs available was greater in the programme area, and the number of non-essential drugs was reduced. Prescribers attended workshops about rational drug use in the programme area and learned how to use standard treatment schedules. They also went to follow-up training sessions. Although knowledge of rational drug use showed only slight improvement, those who had been trained referred to the new treatment schedules on a regular basis. Overall the programme was successful: fewer antibiotics, fewer injections and fewer drugs were prescribed.

Studies of various methods in developed countries have shown that the most effective are also the most expensive and time consuming. These include:

- face-to-face education that focuses on specific problems;
- using structured drug order forms (particularly in institutions);
- regular checking of prescriptions, with feedback to the prescribers.

Methods having some success include:

- involving health professionals themselves in developing appropriate drug lists; and
- holding training sessions on the use of standard treatment schedules.

The least effective methods are often those that are carried out first and include:

- using printed educational materials alone;
- establishing essential drug lists or standard treatment schedules with no educational back-up;
- setting arbitrary limits on prescribing;
- providing unfocused education (such as general lectures on pharmacology).

Prescribing patterns

Knowing what doctors are prescribing helps to decide which intervention methods to use. Finding this out is not difficult, but requires careful planning. Many surveys try to collect too much information from too few sites. An adequate sample could be as few as 30 randomly selected prescriptions, from each of at least 20 sites, giving a total of 600. The indicators used to assess prescribing practices can also be very simple. The ones proposed by INRUD (International Network for the Rational Use of Drugs) include:

- the average number of drugs per prescription;
- the average number of injections per prescription;
- the average number of antibiotics per prescription;
- the percentage of children under five with diarrhoea receiving ORS; and
- the percentage of children under five with diarrhoea receiving anti-diarrhoeal preparations.

Patient care can be assessed by measuring: average consultation time; average dispensing time; and presence of a minimum physical examination (pulse, temperature and skin pinch).

Choose the methods for the intervention strategy on the basis of what has been learned about prescribing patterns. What works best will vary from one country to another and will probably be a combination of the methods listed above.

Richard Laing, INRUD, c/o Management Sciences for Health, 165 Allandale Rd, Boston, MA 02130, USA.

1. Hogerzeil, H V, et al. 1989. Impact of an essential drugs programme on availability and rational use of drugs. Lancet, January 21 pp 141-3.

For more information please contact INRUD at the above address.

Antibiotics and diarrhoea

DD explains how drugs can be used appropriately for treating cholera and acute dysentery.

There are two kinds of diarrhoea for which antibiotics should be given.

Dysentery (acute diarrhoea with blood in the stool) can have a variety of causes. The most frequent and most important is *Shigella*. A patient with acute dysentery should be treated immediately with an effective antibiotic. If the illness is caused by *Shigella*, this will result in a marked improvement within two days: less fever, fewer stools, less blood in the stools, and improved appetite. If there is no improvement, it usually means *Shigella* are resistant to the antibiotic given. Another antibiotic should be given instead.

Suspected **cholera** requires an antibiotic effective against *Vibrio cholerae*, especially if there is severe dehydration. (This is in addition to treatment to replace lost water and electrolytes.) Antibiotic treatment reduces the amount of diarrhoeal stool passed, and usually stops the illness within 48 hours. Cholera should be suspected in any patient who develops acute watery diarrhoea, usually with vomiting, in an area where there is an outbreak of cholera; or when a patient aged over ten years of age develops severe dehydration from acute watery diarrhoea.

• Tetracycline

Tetracycline is the drug of choice for cholera. It rapidly kills *Vibrio cholerae* and therefore reduces the duration of the disease and the amount of rehydration treatment needed.

Pharmacology and how it works

Tetracycline is a broad spectrum antibiotic that kills or slows the multiplication of bacteria. Doxycycline is a slowly excreted form of tetracycline that is effective as a single dose (for adults only).

Adverse effects and precautions for use

Tetracycline is not recommended for children under 12 years, as it is deposited in newly forming teeth and bones, causing discoloration. But, given the dangers of severe cholera, a short course of tetracycline is justifiable. Avoid giving tetracycline if there is significant damage to the kidneys or liver.

• Cotrimoxazole

Also called trimethoprim (TMP)-sulphamethoxazole (SMX), these two drugs are combined in a ratio of 1:5 TMP-SMX, because they work together more effectively than alone. It is the drug of first choice for bacterial dysentery in most parts of the world. It is also used for cholera, in regions where the Vibrio is resistant to tetracycline, or in young children.

Pharmacology and how they work

Antimicrobial resistance to sulphonamides is a growing problem. However, when given together, the two drugs may slow down resistance development. The drugs are absorbed into the bloodstream, reaching bacteria that have invaded the tissues.

Adverse effects and precautions for use

TMP and SMX share some side effects. They slow down the rate at which cells divide and are therefore not recommended during pregnancy, nor for premature or jaundiced infants under one month old. Excretion is through the kidneys, so poor kidney function is a contra-indication for use. Sulphonamides can cause abdominal upsets, including a feeling of sickness or vomiting. Serious effects include damage to the bone marrow and bad rashes, like Stevens-Johnson syndrome.

• Ampicillin

Ampicillin is a broad spectrum penicillin, active against a wide range of bacteria. It is recommended for dysentery, where Shigella are sensitive. However, in many areas most Shigella have developed resistance.

Pharmacology and how it works

Like other penicillins, it acts by interfering with the construction of bacterial cell walls.

Adverse effects and precautions for use

When given by mouth, only about half of ampicillin is absorbed. Absorption is further decreased if it is taken with food. It should be given between or before meals.

Ampicillin often causes rashes, particularly when a patient has certain viral infections, including HIV infection and glandular fever. It should not be given if the patient is allergic to penicillin. Normal gut bacteria may be affected, causing bowel upsets.

• Nalidixic acid

This is one of the 4-quinolone group of antibiotics. Where Shigella organisms are resistant to cotrimoxazole and ampicillin, this is usually the drug of choice for dysentery.

Pharmacology and how it works

Nalidixic acid is easily absorbed from the bowel and blocks bacterial multiplication. Another powerful antibiotic in this group is ciprofloxacin, but it is expensive and recommended only for infections that are resistant to all other drugs.

Adverse effects and precautions for use

Nalidixic acid can cause bowel upsets and skin sensitivity to sunlight. It may produce nervous system disturbances, headaches, giddiness and visual upsets. Avoid use in patients who have a history of convulsions.

• Furazolidone

Furazolidone has both anti-bacterial and some anti-protozoal action. Although slower acting than some antibiotics, relatively few bacteria have developed resistance to it. It is useful when cholera is known or suspected to be resistant to tetracycline.

Pharmacology and how it works

Furazolidone is poorly soluble when taken by mouth. It acts mostly on organisms within the bowel, interfering with their enzyme systems.

Adverse effects and precautions for use

Side affects include bowel upsets, rashes, allergic reactions and sometimes giddiness, drowsiness and headache. Avoid use with drugs that act on the autonomic nervous system such as ephedrine.

Dr William Cutting, University of Edinburgh, UK.

Correction: controlled trials have shown that furazolidone is *not* effective in treating acute dysentery (as suggested in *DD*44 supplement page 3). For references, contact *DD*.

Antibiotic dosages for children by mg/kg body weight

Cholera: tetracycline 12.5 mg/kg 4 times a day for 3 days
or (if local resistance)
furazolidone 1.25 mg/kg 4 times a day for 3 days ***or*** TMP 5 mg/kg and SMX 25 mg/kg twice a day for 3 days

Shigella dysentery: TMP 5 mg/kg and SMX 25 mg/kg twice a day for 5 days
or (if local resistance)
nalidixic acid 15 mg/kg 4 times a day for 5 days ***or*** ampicillin 25 mg/kg 4 times a day for 5 days

Diarrhoea management – Britain lags behind

A recent study in Britain to find out what pharmacists recommend for diarrhoea and how much mothers know about correct management, showed that neither group was always sure about the best treatment for childhood diarrhoea. Diarrhoea is one of the most common illnesses in children for which advice is sought from a pharmacist. It is therefore important that pharmacists give the right advice.

Twenty randomly-chosen community pharmacists in a large city were asked to fill in questionnaires about what treatment they would recommend for diarrhoea. Researchers posing as parents visited half the sample, asking for advice about treating a child with diarrhoea.

All the pharmacists advised some form of purchased treatment, whether ORS or an anti-diarrhoeal drug (both available without a doctor's prescription). But half the pharmacists responding to the questionnaire, and 70 per cent of those visited, recommended inappropriate treatment such as anti-diarrhoeal drugs (e.g. kaolin or loperamide). Although 50 per cent recognised the importance of ORS in their questionnaire answers, less than one third actually recommended it to the researchers who posed as parents. Only 30 per cent of pharmacists in the group visited asked the child's age. None asked about duration of illness or for further details, including about symptoms of dehydration.

Mothers attending child health clinics in the city were also asked about diarrhoea management. Only 15 per cent said they would use ORS (described using a well known brand name) if their child had diarrhoea, although the majority had heard about it. A few (seven per cent) said that they would give their child over-the-counter drugs, such as kaolin and morphine, or loperamide. Nearly half the mothers said they would stop breastfeeding or giving food to their child if he or she had diarrhoea.

Although the numbers interviewed were small, the results suggest a high level of ignorance among British pharmacists and mothers about the treatment of childhood diarrhoea. Most of the pharmacists, however, felt that they should be giving advice on diarrhoea treatment, and said that they wanted more training.

In addition to recommending improvements in training courses for pharmacists, the study suggests that guidelines issued to them should match those used by WHO. Information should include advice on home preparation of ORS and warnings about the use of anti-diarrhoeal drugs.

Goodburn, E et al. 1991. Management of childhood diarrhoea by pharmacists and parents: is Britain lagging behind the Third World? Brit. Med. J. Vol 302:440-443.

ORT is useful for treating adults

I am a regular reader of *DD* and find it very informative. Although I support the emphasis put on the usefulness of ORT in treating diarrhoea in children, I would like to remind readers that ORT is also very useful in managing diarrhoea in adults.

I have been running a hospital-based AIDS clinic for the past four years, and am also involved in caring for HIV infected patients who are members of The AIDS Support Organisation (TASO) in Uganda. Many of my patients suffer from both acute and chronic diarrhoea as a result of their HIV infection and I rely on ORT as an essential part of their treatment.

It took me a long time to convince the patients and their relatives that ORT would be effective in treating their diarrhoea. Sometimes doctors themselves are very reluctant to use ORT. New patients often need to be encouraged to take ORS fluid. However, with persuasion, they realise how helpful the treatment is, and start asking for it regularly. I have heard the patients give these reasons for refusal:

- it is a treatment for children, and not appropriate for adults;
- it does not taste nice;
- it makes me vomit, or feel like vomiting, whenever I take it.

I try to help patients by explaining that:

- ORT replaces both water and minerals which are lost during the bouts of diarrhoea and/or vomiting, and provides energy so that the patient will feel stronger;

Carlos Guarita

ORT benefits adults - including those with HIV related diarrhoea.

- when the patient is vomiting or feeling nauseous, ORS should be taken in small amounts but more frequently;
- ORS should be taken as soon as diarrhoea or vomiting begins, since this prevents the development of dehydration, which can lead to further complications.

We now routinely give ORS to all our patients with HIV associated diarrhoea. They often improve without any treatment with antibiotics. We have also noted a big reduction in the number of patients developing severe dehydration and requiring admission to hospital.

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