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How harmful is diarrhoea?

Apart from the physical suffering and deaths that they cause at the individual and family level, diarrhoeal diseases also play a negative role in national development

by Leonardo Mata

Today, diarrhoeal diseases are considered the commonest and most important single health ·oblem in the developing countries of world, as well as one of the major ·ntributors to malnutrition, poor ılth and inadequate performance of ııldren. Many do not survive its ıstating effects.

Diarrhoea affects host nutrition and ılth through reduction in food con- ıption, alterations in digestion and orption, impaired utilisation of nut- ıts and disturbances in metabolism. Then it occurs repeatedly in children common phenomenon in most less ·veloped countries–their nutrition, wth and development are im- ıred. Due to the debilitating and ıpacitating nature of the disease, ıldren become detached from the ·ily nucleus, while adults may be ıected in their work attendance and ıormance.

Impaired food intake is one of the ıous manifestations of diarrhoea, ırticularly among infants and small ·ildren. Those who have experienced ·ere attacks would recognise its ·ful clinical manifestations: lack of ·etite (anorexia), vomiting, fever, ·fuse loss of fluids through the intes- prostration and weakness.

The anorexia may be worsened by ıral traditions, beliefs or taboos ·ulting in food being withheld for · or weeks since this is thought to ·eve the child. Anorexia and vomit- may result in a reduction of 20 to per cent in food intake. Anorexia · persist for days or weeks regard- · of the kind or amount of stimulation provided. As much as 20 per cent of the expected food intake in traditional populations may be lost due to diarrhoea alone.

Impaired digestion and absorption in infectious diarrhoea result in a small part from the accelerated transit of food through the intestine, but

A case of severe malnutrition resulting from acute diarrhoea.

Photo WHO/M. Levine

mostly from the direct action of agents or their products on mucosal function. Various agents of the disease (viruses, bacteria, protozoa, worms and fungi) affect directly or indirectly the integrity and performance of the intestinal mucosa and sometimes its underlying layers. Some agents multiply or live in the intestinal lumen without causing overt lesions, but they liberate toxins, enzymes or products that impair di gestion, or diminish absorption or in crease secretion into the lumen. Oth micro-organisms actually attach to t mucosal surface and in this mann cause harm. One protozoon adhere the surface of epithelial cells with invading them *(Cryptosporidiu* Others (rotaviruses) invade epithe cells, multiply, and destroy them, t affecting digestive and absorpt functions.

Certain invading bacteria *(Shigel* have the capacity to multiply epithelial cells and in deeper lay resulting in inflammation, ulcerati loss of blood, nutrients and cells, profound alterations in intestinal fu tion. Still other bacteria *(Salmonel* may traverse the intestinal barrie fall into the lymph and blood, and this manner can create havoc, instance causing septicaemia and scesses in organs such as the brain person with diarrhoea may lose much as 10 per cent of the b weight in a matter of hours, with g danger to his or her life. Weight lo not corrected by proper rehydrat and feeding, persists for weeks or e months. The nutritional consequen may persist for as long or longer w the disease becomes chron

As regards altered metabolic fu tions, it is believed that enteric in tions, like other infections, induce release of mediators (hormones) macrophages, which trigger a var of responses in many different or The most obvious are an exa fever, which so commonly accomp persons with infectious diarrho Another alteration in the metabolism consists [illegible]

Proper protection from diarrhoea helps to ensure normal healthy growth in babies.
Photo WHO/J. Mohr

of muscle protein required to energy needs, with resulting e wastage. Metabolic responses ate into losses of nitrogen, vit- and minerals. Other effects are lease of insulin and other hor- depression of plasma levels of zinc and other trace elements, mulation of the immune system. abolic alterations are required e host to cope with infection and ftermath; unfortunately, they a considerable nutrient cost, par- ly for children who are weak or urished as a result of repeated of diarrhoea or other infectious es. These children exhibit persis- eight faltering, stunting (short) and sometimes anaemia. Loss ds and electrolytes (essential and other metabolic alterations y small babies may result in nt or permanent brain damage. t are the psychosocial effects of ea? It is impossible to know nfants and small children feel hey fall ill, but it must be similar to, and possibly more serious than, the experience of adults. During a severe attack of acute watery diarrhoea or dysentery, we feel great anxiety and fear; we are restless and exhausted. The cramps and tenesmus (straining) are very uncomfortable; if dehydration occurs, there is pain in the legs and other parts of the body; fever and headache, and cold sweating during defecation, are among the most unpleasant and fearsome signs and symptoms that we may experience. Somehow we know that the disease we are suffering is serious, one that debilitates us and threatens our existence. The anxiety and fear are easily recognised in the eyes of sick children, and may be similar to those seen in cases of child abuse.

Children with diarrhoea are not very pleasant to be with, especially if smelly and unloving children, and they may be rejected by their own families, particularly when they suffer from repeated or chronic diarrhoeal episodes. In the process, they may be subjected to various forms of neglect, abuse and deprivation.

Because the overall time of possible interaction with the mother or family is reduced, diarrhoeic children have diminished opportunities to learn and develop within the home and to explore the environment. If they attend school, absenteeism due to the disease or its complications may interfere with learning, progress and completion of training.

Malnutrition

It is clear that children who suffer from several attacks of diarrhoea eventually become malnourished. Restriction in food intake, losses of fluid, nitrogen and other nutrients, and altered digestion, absorption and metabolism induce progressive wasting and stunting. The effect of diarrhoea on nutritional status is accentuated when the child has experienced malnutrition *in utero*. Children who have suffered from intrauterine growth retardation, and who have an impaired immune function, are more prone to severe clinical manifestations of infection and malnutrition.

Malnourished children in turn are more likely to develop severe protein-energy malnutrition when stricken by an acute infection–whether diarrhoea itself, measles, whooping-cough or another common communicable disease. Thus, in regions where lack of food is not the primary factor (that is, in most of the developing world), diarrhoea may be regarded as the main inducer of progressive wasting and stunting of the child population. It is also a cause of diminished productivity and well-being, and of absenteeism from work by the adult population.

One additional reason why it is more threatening than other infectious diseases is its higher frequency and greater complexity, particularly in small children. The incidence may be as high as six to 12 episodes per child per year in most developing countries.

ng treatment and prevention difficult. The total diarrhoea bidity for a given child may be as as one-third of its first two years te. Overall, children are ill with rhoea for 10 to 20 per cent of their three years of life.

bviously, children debilitated by vicious interaction between diar-a and malnutrition are at high risk lying prematurely. Mortality statis-for most developing countries rate rhoea as a main killer of infants young children, occupying the or second place in most countries. he tropical belt, it may account for o 40 per cent of all deaths in the ier-fives, that is, several million vear.

Any child can die from diarrhoea rdless of its nutritional status. l-nourished children with diar-a plus dehydration or toxicosis die within a few hours if the tious dose ingested was large, and ompt assistance was not provided. re is still some mortality due to rhoea in industrialised countries. the effect is more serious in chil-who already exhibit some mal-rition. They do not have enough ly stores and therefore become lly dehydrated; also, their im-ne response may be altered, for nce in those with fetal growth rdation.

is quite obvious that controlling preventing diarrhoea is a *sine qua* tor improving nutrition and health increasing survival of the child ulation. The sizeable reduction in rhoea mortality in Chile, China, ta Rica, Cuba, Mauritius, Trinidad Tobago and other countries is a d omen; it shows that this disease be controlled in less developed tries, without their necessarily ergoing industrialisation and de-ping a large capital income. The tant thing is that, in countries re significant control has been at-, there has been clear recogni-of the negative role of diarrhoea ional development, and a politi-lecision has been taken, with omic backing, to invest in holistic ventions aimed at its control and ention. ■

Egypt: social marketing approach

by Hosny A. Tammam

On the recommendation of WHO, the Ministry of Health of Egypt started to advocate the use of oral rehydration therapy for diarrhoeal diseases in 1961. Five years later, when the Ministry published a booklet offering guidelines on maternal and child health, a formula for oral rehydration salts was included.

Distribution to health centres of ORS packets supplied by UNICEF was instituted in the following decade, and since 1982 the packets have been manufactured in Egypt by the Chemical Industries Development Company.

Meantime, a study conducted in a project on "Strengthening of Rural Health Delivery Services" provided ample evidence that diarrhoea mortality in children could be reduced by ORT. The government signed a grant agreement with the United States Agency for International Development (USAID), and in January 1983 the National Control of Diarrhoeal Diseases Project (NCDDP) started operations. It was designed to reinforce, expand and accelerate diarrhoeal diseases control activities.

The ORS emblem has become familiar throughout Egypt.

Photo WHO/H. Tammam

A major innovation of the project has been to blend modern health services with a social marketing approach, using the mass media—including television, radio, printed materials, posters and billboards—to reach a maximum number of people with uniform messages. Public events with the added attraction of well-known entertainment personalities have also played their part.

More than 70 per cent of Egypt's population have regular access to television, and more than 90 per cent listen to the radio. Consequently educational messages reach a majority of the population within a very short time. There have now been three annual television campaigns to drive home the message about oral rehydration. That in 1985, for instance, used 11 "spots" of either one minute or 30 seconds, each rotated on a two-week cycle. The messages included how to recognise dehydration in children, the proper use of ORS, the importance of breastfeeding and continued nutrition during illness, and preventing diarrhoea through personal hygiene. These messages also find their way into materials used for training health workers.

In less than three years, the death rates from diarrhoea in children aged under two years have been reduced throughout Egypt from 130,000 deaths annually to about 40,000. In terms of infant mortality, the reduction has been from about 91 per thousand to 44 per thousand.

Use of ORS has increased from one per cent of diarrhoea episodes to 70 per cent. Some 3,000 rehydration centres have opened in primary health care facilities ranging from hospitals to rural units, and in 1984 nearly one million children attended these centres. Over 12,000 health workers have learned rehydration techniques, and the annual production of ORS is now around 15 million litres.

So the NCDDP has succeeded, in just under three years, in mobilising the public and private sectors in a coordinated campaign to lower infant and young child mortality from diarrhoeal diseases. ■