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ON DIARRHOEAL DISEASE CONTROL
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WHO GLOBAL DIARRHOEAL DISEASES CONTROL PROGRAMME

by

Dr D. Barua* and Dr M.H. Merson*

*Diarrhoeal Diseases Control Programme, Bacterial and Venereal Infections Division of Communicable Diseases, World Health Organization, Geneva, Switzerland.

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World Health Organization, Geneva, Switzerland

This paper will review, from the global perspective, the development and direction of the new WHO Programme for the Control of Acute Diarrhoeal Diseases by briefly examining: the magnitude of the problem of diarrhoeal diseases; the relatively new research findings which have greatly stimulated this initiative; and the global strategies for control of diarrhoeal diseases that Member States may employ in technical cooperation with the Organization.

1. The problem

It is universally agreed that the diarrhoeal diseases are one of the major causes of morbidity and mortality in the developing world, especially in infants and young children. While it is not possible to review all the studies that give support to this statement, it is useful to summarize some of their conclusions as they reveal the wide range and magnitude of the problem. For example:

- On a global scale it is estimated that in 1975 there were about 500 million episodes of diarrhoea in children below 5 years of age in Asia, Africa, and Latin America - about 6 million of this age group die of diarrhoeas every year.

- In a 1973 survey from Latin America, diarrhoeal diseases accounted for 29% of all deaths in children below 5 years of age and were by far the major single cause of death.

- A WHO Study Team working in 7 countries in 1960-1965 reported that each month 30-40% of young children in the communities surveyed had diarrhoea.

- A number of studies have shown that malnourished children have up to a 50% higher incidence of diarrhoeal diseases and have more severe diarrhoea than normally nourished children; diarrhoeal diseases, in turn, have been shown to be one of the most important contributors to malnutrition because of food withdrawal, accompanying anorexia and malabsorption.

- In the developing countries as much as one-third of the beds in children's hospitals are occupied by diarrhoea cases receiving expensive antibiotics and intravenous fluids, putting a heavy burden on the limited budget for health care.

- Since 1961 cholera has been reported by 88 countries, and has caused major outbreaks and become endemic in areas where the incidence of diarrhoeal diseases is high and water supply and sanitation facilities are inadequate; the present pandemic has not ended as yet as 8 countries were infected for the first time in 1978.

The overall importance of diarrhoea-related mortality as a cause of infant deaths cannot be overemphasized. One nice demonstration of this was the recent analysis of mortality data from Costa Rica for the period 1965-1976; during this period diarrhoea-related mortality declined from 2 per 1000 to 0.5 per 1000 population while overall infant mortality proportionally declined from 80 per 1000 to 30 per 1000 population.

In a very important, and more general sense, diarrhoeal disease also lessens the quality of life for the very young, especially during the weaning period. For instance, in a rural community in Guatemala the percentage of life experienced with diarrhoea has recently been estimated to be almost 10% in the last half of the first year of life and over 15% during the second year and first half of the third year. This means that in this critical period of physical and cognitive development children experience diarrhoea one full month out of every six.

2. Recent research findings

A great deal of new and exciting knowledge has been acquired in the field of diarrhoeal disease. First, and probably foremost, there is now a single modality - oral rehydration fluid - that can be used by itself to successfully treat dehydration in all but the most severely dehydrated patients without any intravenous therapy. Much of the pioneering work demonstrating the scientific basis and application of oral rehydration therapy in hospitals and field situations was done in the developing countries. About 8 years ago, WHO began recommending the use of an oral rehydration solution with a single formula containing sodium chloride, sodium bicarbonate, potassium chloride, and glucose. This solution has been used globally for the successful treatment of diarrhoea of all etiologies in all age groups.

Evidence has also been accumulated from studies in the Philippines, and subsequently in Turkey, Iran, Egypt and Liberia, which suggests that when this oral rehydration fluid is given early in the course of diarrhoea, along with education on proper dietary practices that should be followed during and after diarrhoea, there is more weight gain over time. These proper dietary practices include feeding a child as soon as possible during diarrhoea and increasing food intake after diarrhoea ceases. There is little doubt that with proper education oral fluid can be mixed and administered by mothers at home. In addition, it has been estimated that the implementation of programmes delivering oral rehydration can perhaps save governments as much as $600 000 for each 5 million population covered.

Another important development has been the recognition of the role of new viral and bacterial agents, which now makes it possible, under ideal laboratory conditions, to identify the cause of as many as 80% of acute diarrhoea cases visiting treatment facilities; this is a reversal of the situation prevailing only a few years ago when 80% of the cases were undiagnosed. Two agents in particular, enterotoxigenic E. coli and rotavirus, probably are responsible for up to 60-70% of acute diarrhoeas in children 6-24 months of age. While the recognition of enterotoxin-producing E. coli requires relatively sophisticated biological assays, the rotavirus is now very simply detected in stool by an enzyme assay (ELISA) that can be done in most minimally equipped laboratories.

With this increased knowledge of the agents of diarrhoea, it will undoubtedly be easier to understand the epidemiology and pathogenesis of the acute diarrhoeal diseases and to develop better means for their prevention and control. In addition much has recently been learned about the mechanisms of intestinal immunity which must be invoked to protect against disease caused by these agents. Using animal models, it is better understood how lymphocytes that are generated in the intestine circulate through the lymphatic and circulatory system and home back to the intestine under exposure to foreign antigens. That some of these intestinal lymphocytes circulate into the breast is of particular interest as it provides an additional explanation for the well-established observation that breast-fed infants have greater immunity to intestinal infection than bottle-fed infants.

In another aspect, it is now generally accepted that the provision of safe drinking water alone is not sufficient to prevent acute diarrhoeal diseases. In addition to safe water there must also be adequate sanitation facilities and a desire on the part of the community to use and maintain both types of facilities. It is unfortunate, but the pace at which rural communities will obtain these facilities will be slow; as of 1975 only 22% of the world rural populations had access to water supplies and 15% to excreta disposal facilities.

3. The Global Programme

Recognizing the extent of the problem caused by all acute diarrhoeas and the exciting new advances in knowledge, Member States have urged WHO to initiate a Diarrhoeal Diseases Control (DDC) Programme as a high priority programme of the Organization. The Programme meets all the criteria of a technical cooperation programme as endorsed by the WHO Executive Board in that (1) it is an activity that has a high degree of social relevance; (2) it can contribute significantly to improvement of the health status of the population through methods which can be applied now at a cost that can be afforded now; and (3) it conforms to the principl of developing national self-reliance in matters of health.

At the outset of the programme, in May 1978, the Organization convened a Technical Advisory Group to review the current WHO activities in the field of diarrhoeal diseases and recommend appropriate objectives and strategies for the DDC Programme. Based on their recommendations we have adopted, as the immediate or short-term objective of the Programme, the reduction of mortality from acute diarrhoeal diseases as well as their associated ill effects, particularly malnutrition in children, by promoting oral rehydration therapy and related nutritional practices as an essential element of primary health care. The longer-term Programme objective is to reduce the incidence of acute diarrhoeal diseases, especially in children, so that they no longer constitute a public health problem, by promoting improved child care practices, the acceptance, utilization and maintenance of water supply and sanitation facilities, and epidemiological surveillance In line with both these objectives the Programme will also coordinate and support research to develop new tools and techniques for treatment and prevention.

The DDC Programme is developing under the umbrella of Primary Health Care and in close collaboration with other related WHO programmes, particularly those of Maternal and Child Health, Nutrition, Health Education, Appropriate Health Technology, Environmental Health and Communicable Diseases Control. It consists of two major components - an implementation or health service component, and a research component - each of which will include a training element for national manpower development.

Implementation

The major task envisaged under the implementation component of the DDC Programme is for WHO to work as a partner with national health authorities in the development of national DDC programmes. It is anticipated that these national programmes will be developed as a part of country health programmes in the context of primary health care, with a focus on rural and peri-urban areas (and not as a vertical programme). It is expected that these programmes will evolve from pre-existing activities and resources and that it will be important to go through the formal exercise of programme planning in their initial stages. This process, in which WHO will be glad to participate, will include: analysis of the epidemiological situation, current activities and available resources; establishmer of objectives and targets and planning of appropriate activities; identification of training and logistical needs; preparation of a budget; and planning for programme evaluation.

The view has been expressed in various discussions that the identification of a national coordinator with the necessary competence, motivation and influence to ensure implementation, including the training of manpower and evaluation of the programme, may be the single most important factor for the success of national programmes; the existence of an inter-ministerial advisory body to advise on the programme will certainly be very helpful. Unless active national commitment at the highest level of government and participation at all levels are secured, no long-term impact can be expected.

Oral rehydration therapy has been clearly identified as the most appropriate strategy for immediate application because of its practicability as well as its potential impact if it can reach the underserved population in rural and peri-urban areas; therefore, all existing health manpower, including village health workers, maternal and child care workers, traditional healers, birth attendants and workers at all treatment facilities must be trained to use this therapy properly and to recognize its advantages and limitations. The development of materials for national training courses for health workers, as well as the planning of educational and promotional activities for communities, will undoubtedly constitute an essential part of the preparatory phase of country programmes. Other channels outside the health field, like agricultural extension workers, department of education workers and commercial avenues, should also be incorporated into the programme. This coordinated approach is important as many of the countries presently using oral rehydration are not deriving full benefit from it because of a failure to maintain a continuous supply of ORS packages and inadequate training and in its proper use. National authorities may find it desirable first to implement the programme in a limited area before embarking on countrywide implementation to gain experience in planning, estimating costs and developing a cadre of trained health workers.

Other salient features of programme development and implementation at the national level, including recommendations on evaluation, are discussed in the Advisory Group Report (document WHO/DDC/78.1). Within the next year, regional planning meetings will be held in 5 regions (South-East Asia, 18-23 June 1979; Western Pacific, 5-7 June 1979; Eastern Mediterranean, 11-14 June 1979; Americas, autumn 1979; Africa, early 1980) to initiate the development of national programmes for control and research based on the available strategies and the most appropriate means of application in various countries. It is expected that these national programmes will form the basis of regional DDC programmes and ultimately of the Global Programme.

Research

Despite the considerable technological advances in recent years, there is an urgent need to continue research efforts to further improve the control strategies. The research component of the DDC Programme will thus be goal-oriented and will be designed to support activities that offer the best chance of developing better measures for control. The global and regional Advisory Committees on Medical Research (ACMR) have established a sub-committee at the global level and study groups at the regional levels to coordinate these research activities. The sub-committee of the GACMR will meet in Atlanta, USA, from 17-19 September 1979 to discuss the research programme in detail.

Although the mechanism of the research programme at the global level is not yet finalized, it is envisaged that the Technical Advisory Group (TAG), which will be responsible for the guidance of the entire DDC Programme, will allot funds for each of 5 principle areas of research. These areas are: Immunity and Vaccine Development, Clinical Management of Acute Diarrhoea, Child Care Practices related to Diarrhoea, Etiology and Epidemiology, and Environmental Health and

Diarrhoeal Diseases Prevention. Scientific Working Groups (SWGs) are reviewing the current knowledge and recommending priority areas for research in each of these areas, and in the first 3 areas listed have already met. Because of the large number of recognized diarrhoeal pathogens, five subgroups are being convened in the area of Etiology and Epidemiology; these will be concerned with Escherichia coli diarrhoea, rotavirus and other viral diarrhoeas, cholera and other vibrio infections, diarrhoeas due to bacterial pathogens, and parasite-related diarrhoea; the first 2 of these subgroups have already been convened. By February 1980 all the SWGs and subgroups will have met. The reports of these groups will be widely distributed and will be used by Steering Committees which will soon be established to manage the research activities in different areas.

The regional multi-disciplinary study groups will perform similar reviews and will decide on regional research priorities; they will also identify research workers and institutions in their region that can undertake research projects. Special emphasis will be given to strengthening of research capabilities especially by development of collaborative research projects among developing countries as well as between institutions in the developing and developed countries.

Global activities

As promotor of and partner in this technical cooperation programme, WHO, in close collaboration with UNICEF, is prepared to provide critical inputs for national DDC programme development. At the global level WHO is presently developing materials that may help in programme formulation, training of national workers and community education. These include guidelines and a training course on programme formulation for country DDC programme coordinators; manuals on diarrhoea treatment for physicians and for primary health care workers; a diarrhoea diseases compendium; separate guidelines for epidemic control, epidemiological investigations and simple measures for water purification and sanitation; and a laboratory manual for diagnosis of common diarrhoeal pathogens in minimally equipped laboratories. To help promote research, an annotated bibliography and reports on research recently undertaken will be periodically distributed. At the same time, UNICEF is fully committed to assisting countries in the procurement and local production of packages of oral rehydration salts, and guidelines for local production are being prepared as recommended by a joint UNICEF/WHO Consultation on the National Production, Packaging and Distribution of Oral Rehydration Salts which was held in Bangkok in January 1979.

The launching of this Programme has been helped by a key financial contribution from the Government of the United Kingdom of Great Britain and Northern Ireland; the World Bank and UNDP have expressed strong interest in supporting some of the research areas and a number of other international agencies and governments are presently considering providing support to the Programme.

It is, however, evident that to maintain its momentum, a maximum commitment on the part of the countries themselves will be essential. It is hoped that the regional planning meetings will soon be followed by the development of such national programmes.