



Dr. I D Ladnyi, Assistant Director General, WHO Geneva, speaking at the opening session of the Regional Conference on Diarrhoeal Diseases sponsored by ICDDR,B and NICED of India.

like diarrhoea. The next meeting is proposed to be held in Calcutta in 1982, later in any other country of the region which might be ready to host it.

The opening ceremony was addressed by Professor M A Matin, Minister for Health and Population Control, Govt. of Bangladesh; Dr. I D Ladnyi, ADG, WHO and Dr. WB Greenough III, Director, ICDDR,B. A message from Dr. V T H Gunaratne, Regional Director of SEARO WHO was delivered by Dr. Sestak, the Bangladesh Representative of WHO.

The participants and the organisers discussed the future plan of operation. It was the general consensus that since cultural habits and geographical ecology exert a great influence on incidences of diarrhoea, future meetings at regular intervals would be useful. Since the present

SCIENTIST MEET TO SHARE KNOWLEDGE ON DIARRHOEA

The Regional Conference on Diarrhoeal Diseases organized jointly by ICDDR,B and the National Institute of Cholera and Enteric Diseases (NICED), India was held in Dacca from 16th-20th February 1981.

Explaining the objectives of the Conference, the Chairman of the Organizing Committee, Dr. M M Rahaman of ICDDR,B said that diarrhoeal diseases have peculiar regional characteristics, it was therefore felt that a conference of this nature would have far reaching effects in identifying the research priorities of relevance to Asian

Countries. This would help in controlling the high rate of morbidity and mortality caused by diarrhoeal diseases. The exchange of ideas between scientists would not only enrich the knowledge but would also provide an opportunity to compare the progress of each others work in respective areas of interest.

Dr. S C Pal of the National Institute of Cholera and Enteric Diseases, Calcutta, and Vice President of the Organizing Committee emphasized the need of collaborative effort in research, especially in the case of a disease

meeting was represented by scientists from a wide geographical area it was proposed that the name should be changed from "Regional Conference on Diarrhoeal Diseases" to "Asian Conference on Diarrhoeal Diseases."

It was proposed that each year the Conference would start on the last Monday of February in one of the countries of Asia. In addition to the two sponsors ICDDR,B and NICED, more sponsors would be welcome. The next Asian Conference on Diarrhoeal Diseases would be in Calcutta from February 23, 1982.

Following are the condensations of the abstracts of the papers presented at the Regional Conference on Diarrhoeal Disease. The proceedings are waiting publication. For copies of the proceedings one may write to the Publication unit of ICDDR,B.

It was clear from the papers presented on rotavirus by Dr. M Mathan of Christian Medical College Hospital of Vellore India, Dr. C K Jayaram Panniker of Calicut Medical College, Kerala and Dr. L N Mutanda of ICDDR,B, that rotavirus had seasonal characteristics and incidences were highest between November to February, the cooler months. Rotavirus was highest among 3-5 month olds in Kenya but among 6-8 month olds in Bangladesh. Evidence from Kenya also shows that domestic animals are also affected by rotavirus and may act as carriers.

Dr. Ayesha Molla of ICDDR,B studied the effect of diarrhoeal diseases on the absorption of macronutrients. It was found that in diarrhoea due to rotavirus, patients absorbed significantly less fat and calories than in diarrhoea due to ETEC and *V.cholerae*. Carbohydrate absorption was least affected in all diarrhoea.

Dr. B S Anand of the G B Pant Hospital of New Delhi studied the pathogenesis of diarrhoea and malabsorption in infection with *Giardia lamblia*.

Giardia interferes with the active transport mechanism of the enterocyte, and does not form a mechanical barrier. In *Giardia* infection the damage is primarily localized to the epithelial membrane of the enterocyte, with a decrease in the number of specific substrate receptor sites and brush border enzymes.

Dr. Nigar Shahid of the Dacca Medical College Hospital indentified respiratory illness, diarrhoea and conjunctival dryness as the long term complications of measles. A link was established between measles, diarrhoea and conjunctival dryness (vitamin A deficiency) but the effect on growth was not established.

Dr. D Mahalanabis of the Kothari Centre of Gastroenterology, Calcutta reported the suitability of an ORS containing glycine instead of glucose and acetate instead of bicarbonate in children aged 4 months-5 years. Acetate in ORS was not only as good as carbonate to correct acidosis but was also

more palatable and well tolerated.

Dr. A M Molla of ICDDR,B studied the efficacy of a cereal based (rice powder) electrolyte solution as oral rehydration media. His findings indicate that the cereal based (rice powder) electrolyte solution is as good as sucrose electrolyte solution in the correction of dehydration and maintenance of fluid and electrolyte balance.

Mr. M A Wahed of ICDDR,B presented the results of the two year study of ORS prepared at home by village women using packets or locally available molasses and salt. Laboratory analysis showed that the glucose and electrolyte contents of both solutions were within acceptable limits.

Dr. B C Deb of NICED, Calcutta studied for two years the effect of prompt oral rehydration therapy on the nutritional progress of the children with diarrhoea in the slum areas of Calcutta. There were no noticeable weight or height gain among children receiving oral rehydration therapy in comparison to those who did not. Diarrhoea was (17%) more prevalent among children in Grade II malnutrition status.

Mr. Akbar Ali of ICDDR,B studied the quality of ORS packets made by trained house-wives following the WHO formula. The weight and electrolyte contents of the packets of the solution were satisfactory. During a 8 month shelf life of the polythene packets—some physical changes, 10-15% reduction of HCO_3^- —and 4-7% reduction of sugar was detected. Chloride estimated by titrimetric analysis was developed as the simple method of quality control in ORS.

Dr. M R Islam of ICDDR,B compared effectiveness of ORS with or without sodium bicarbonate. His conclusions were:

1. Neither solution (with or without sodium bicarbonate) can effectively treat all patients with high stool output.
2. Oral solution without sodium bicarbonate cannot fully cor-

rect acidosis.

3. Potassium depletion developed in both groups (salt-sugar or molasses-salt), but was more pronounced in the salt-sugar failure group (molasses contains some natural potassium).

Ms. Susan Zimicki of ICDDR,B studied the diarrhoea incidence rates and the case hospitalization rates in Matlab (a field area of the ICDDR,B). The incidence rates were lower than expected; annually 1.4 episodes for less than 2 year olds. 1.01 for 2-4 year olds, 0.56 for all age groups combined. The case hospitalization rate was highest for the under 2; about 7/100 overall, with males accounting for 30% more hospitalisation than the female.

Dr. C V Baltazar, Ministry of Health, Philippines described her experience on ORS utilization at the Mariveles Mental Hospital in Philippines. ORS was especially effective in reducing suffering and deaths due to diarrhoea in the hospital. The simple preparation and easy administration was highly recommended for patients who are mentally ill.

Dr. V Kumar of the Postgraduate Institute of Medical Education and Research, Chandigarh, India, found that the knowledge and attitude of the community health workers regarding treatment of acute diarrhoea in children is important. In spite of easy and wide availability, correct application and use of ORS depended on the training of the health worker. Success of treatment depended on length, frequency and mode of training of the health workers.

Dr. Mizanur Rahman of ICDDR,B reported on the pilot project to train village practitioners to treat diarrhoea patients in remote rural areas. In an evaluation, one year after training, it was observed that the practitioners were managing 84% cases with oral rehydration; Hospital referral and case fatality was negligible.

Dr. Abu Eusof of ICDDR,B related his experience in the use of oral rehydration therapy in an outbreak of diarrhoea. Case fatality was brought down from 41% to 6% with surveillance and ORT distribution. Simple education and ORT can reduce the mortality due to diarrhoea in an outbreak.

Mr. J. Chakraborty of the ICDDR,B presented the results of a survey on the knowledge,

attitude and practice of the women of a rural area concerning diarrhoea. There was an universal recognition of diarrhoea as an increased number of large volume of watery stool. Major cause of diarrhoea mentioned was particular types of food (such as green vegetables or chillies) or too much of a certain food (such as pumpkin). Diarrhoea was considered harmful because it causes weakness.

Dr. Promod Mullick of Al-Sabah Hospital of Kuwait studied acute gastroenteritis in children. About one fifth of all admissions in the paediatrics ward were due to gastroenteritis, which constituted largest single cause of admission. Incidences were highest among babies less than six months old (86% were bottle-fed and 14% breastfed) then tapers off by 5 years, mortality was also highest among the babies less than six months.

Dr. M I Huq of ICDDR,B characterized the *Campylobacter* species isolated from patients suffering from gastroenteritis. *Campylobacter* was more prevalent (10-16%) in the age group 0-10 years than in older patients (2-8%). All the strains were sensitive to Chloramphenicol, Erythromycin, Gentamycin and Furazolidone and only partially sensitives to septrin (22.5%) and penicillin (25.7%). The strains produced toxin, 12.5% were positive in infant mouse assay and 4.5% positive in illeal loop model.

Dr. B C Deb of NICED, Calcutta showed that though fish and shrimp were suspected to cause diarrhoea due to *V. parahaemolyticus* (10-15% of patients admitted with gastroenteritis) a case study did not confirm it, rather healthy carriers were present in (15%) contacts of index cases.

Dr. S C Sanyal of the Banaras Hindu University, India studied the enteropathogenicity of the "so-called NAG" vibrios and the relation of their enterotoxin with that of cholera and *E. coli* LT. 59 serotypes of NAG vibrios produced heat labile enterotoxigenicity similar to *V. cholerae* 569B. The optimum PH range was 6-8. Tests indicated that the enterotoxin of the NAG vibrios might act through mediation of cAMP, but lacked in invasive capacity. 50 NAG strains could be neutralized by cholera and *E. coli* LT antitoxin. Culture filtrates of 11

serotypes gave precipitin bands with cholera antitoxin and reacted identically with cholera toxin.

Dr. Shahjahan Kabir of ICDDR,B presented the composition and immunobiological properties of the cell envelope components of *Vibrio cholerae*. His findings suggest the presence of a common protein antigen in the outer membrane of the *V. cholerae* of EL Tor and classical biotypes and Ogawa and Inaba serotypes.

Dr. Leif Gothefors of ICDDR,B reported on the studies of immune of cholera B subunit, which in the purified form is probably the best candidate for an oral non living cholera toxin derived immunogen. The oral immunization tended to produce longer antibody re-

younger children. A clone of multi-resistant *S. typhimurium* of phage type 66/122 appeared in Bangalore in 1978 and spread all over India. Drug resistant salmonellosis has also been detected in outbreaks all over South East Asia.

Dr. G H Rabbani of ICDDR,B described the efficacy of a large single dose (SD) of ampicillin therapy for the treatment of severe shigellosis. This was found to be clinically effective in adults and children over four years. Children under four tended to have a bacteriological relapse.

Dr. Moslemuddin Khan of ICDDR,B showed in his paper that a very simple intervention, washing hands with soap and water, can bring down incidences of shigella



The Director, ICDDR,B having an informal discussion with Dr. S C Pal Director NICED, India and Dr. Vijoy Kumar of PGIMER, Chandigarh India.

sponse than the intramuscular immunization.

Dr. M Subba Rao, WHO fellow from India visiting ICDDR,B described the role of convalescent carriers in the transmission of cholera. Use of antibiotic reduced the convalescent carrier rate in cholera patients from 14% to 4.3%.

Dr. K. B Sharma of Lady Hardinge Medical College, New Delhi described the epidemiology of the drug resistant salmonellosis in India. In Calicut, R-plasmid was first documented in 1972, then in 1978 a clone of multidrug resistant phage type O was detected in South India. Paediatric units of hospitals are most infected and mortality is also higher among

dysentery even when all other conditions remain the same.

Dr. V I Mathan of the Christian Medical College Hospital, Vellore India presented the profiles of *Shigella shiga* outbreaks in Southern India. In an outbreak in 1972, 28/100 were affected in a village, most affected were the under fives. The water supply yielded faecal coliforms. There were three outbreaks of dysentery due to multi-drug resistant *Shigella shiga* (caused by a transferrable plasmid) in different parts of South India between 1976-79.

Mr. K M A Aziz presented an anthropological paper on the "parda" (religious and cultural practice of confining women within
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ANTIMICROBIAL DRUGS IN THE MANAGEMENT OF DIARRHOEAL DISEASES

Adapted from a paper presented by Dr. M M Rahaman of ICDDR,B at the Inter-Regional Training Course on Diarrhoea.

Rehydration is the most important therapeutic measure in the management of acute diarrhoea. In patients suffering from severe dehydration and shock, intravenous infusion may be considered as a life-saving measure. Later oral rehydration should be used to maintain the status of hydration by matching the output (stool, urine as well as insensible loss).

Antibiotics used as an adjunct may be useful in shortening the duration of illness in some specific acute diarrhoeal diseases like cholera. The WHO Manual for the Treatment of Acute Diarrhoea gives the suggested line of use of antibiotics. (WHO/CDD/SER/80.2).

Antimicrobial Agents in Cholera

Studies have shown that appropriate antibiotics reduce the duration of diarrhoea; therefore, during epidemic periods with proper use of antibiotic, patients may be discharged promptly.

Tetracycline, and other antimicrobials found to be useful in cholera are furazolidone, trimethoprim-sulphamethoxazole and chloramphenicol. The use of chloramphenicol is not advised due to its toxicity; ampicillin, streptomycin and the sulphas, have not been found to be effective. Use of the sulpha drugs are emphatically discouraged.

Two, 100mg doses of a derivative of tetracycline, like the doxycycline, may be given 12 hours apart and then repeated once a day for the next three days. Pregnant women and children below three should not be given tetracycline, 100mg doses of furazolidone every 6 hours have been found to be a satisfactory alternative.

Antibiotics in Shigellosis

As some forms of shigellosis is

short and self-limiting, antibiotics should not be used. However, in severe shigellosis, (due to *Shiga bacillus*) early antibiotic therapy could be life-saving in small and malnourished children who are passing bloody stool. Early antibiotic therapy in such patients may reduce the loss of protein, and thereby prevent the development of further malnutrition. Oral rehydration to combat dehydration is adequate in most cases of shigellosis. Use of intravenous infusion is rarely required.

The choice of antibiotic is determined by the existing resistance pattern. In Bangladesh, for example, ampicillin is still the drug of choice. However, in each country one has to test a large series of strains to choose the most suitable antibiotic, considering not only its cost but its availability as well. A single dose ampicillin regime has been found to be effective in adults, although there were few failures in children.

Trimethoprim-sulphamethoxazole also have been found to be effective in sensitive strains of shigellosis.

Antibiotics in Salmonella Infection

No antibiotics should be used if salmonella food poisoning is suspected. Use of antibiotic usually prolongs the carrier state, which helps spread of the disease. Antibiotics should be used only if a patient shows persistent systemic manifestation of severe salmonellosis. Antibiotics most often used are chloramphenicol, ampicillin and trimethoprim-sulphamethoxazole. As an example, septicaemic manifestation of salmonella infection in neonates must be treated with suitable antibiotic and supportive therapy.

Amoebic Dysentery

In severe dysentery-like symptoms with confirmed presence of vegetative form of *E. histolytica*, one should use an amoebicide drug.

Metronidazole is still the most useful drug, although emetine has been used as a satisfactory alternative. Tinidazole also has been found to be equally effective.

Acute Giardiasis

In Giardiasis, metronidazole and quinacrine, are found to be effective in eradicating the infection.

Prophylactic use of Antibiotics in Diarrhoea

Antibiotics have no use as prophylaxis even in epidemics of cholera. Indiscriminate use of antibiotics, produces resistant strains which makes management of diarrhoea very difficult. Bangladesh and Tanzania have already reported the emergence of multiple antibiotic resistant *Vibrio cholerae*.

Abstracts

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the home) and health practices with reference to defaecation habits and water use pattern in a remote rural area. Women formed the habit of defaecating and collecting water either before sunrise or after sunset thereby creating scarcity of water during the day time. During the day, children collected water thereby increasing the chances of contamination.

Dr. Azad Khan of the Institute of Postgraduate Medicine and Research, Dacca studied the morphology of the rectal mucosa of five categories of patients:

- a. normal volunteers
findings: normal mucosa
- b. irritable bowel syndrome: (already had one or more courses of antibiotic)
findings: normal mucosa
- c. amoebic dysentery
findings: diffuse inflammation like ulcerative colitis; patchy ulcers
- d. bacillary dysentery
findings: Severe ulcerative colitis; superficial ulcers and the lamina propria infiltrated with neutrophils
- e. unclassified dysentery
findings: ulcerative colitis; chronic and acute inflammatory cells in lamina propria

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