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DIARRHOEA DILEMMA

Health And Society Group

Oral Rehydration

The Principles, Practice and the Possibilities

Malathi Damodaran

Oral rehydration technique is one of the most important breakthroughs in the field of appropriate technology in health care. It is important not only because it is cheaper but because it proves that health care can be simplified and demystified so that masses can take care of their own health without medical sophistication. This would be real 'Health By the People.'—Ed.

Malnutrition and diarrhoeal disease constitute two most important causes of morbidity and mortality in young children of the developing world. The effect of repeated attacks of diarrhoea in producing and perpetuating malnutrition is well established.

Acute watery diarrhoea is caused by a variety of bacterial and viral agents. Some of these agents produce diarrhoea by invading and reproducing within mucosal cells of the bowel and damaging the mucosa, resulting in water and electrolyte loss, while some others colonize the lumen and produce enterotoxins. These different pathopysiological mechanisms produce the disease, which is generally self limiting and is characterized by :

1. Passing of isotonic fluid which may be similar to or differ from plasma in the electrolyte content; depending on the rate of output.

2. Disaccharidase deficiency also is noted during the diarrhoeal and early convalescent period.

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Dehydration, the cause of immediate morbidity and mortality in diarrhoea, occurs as a result of loss of fluids and electrolytes from the body. When the loss is rapid and large and the age younger, the dehydration may be severe, manifesting as shock and leading to death. However, in a majority of cases, the dehydration may be mild or moderate, manifesting as increased thirst, decreased urine output, decreased skin turgor and dryness of mucosa.

The long-term effects of repeated diarrhoeal attacks are largely nutritional, and most pronounced in young children, who have marginal food intake. The cumulative effects of increased demands, protein catabolism and decreased intake resulting from anorexia and often imposed fasting during the illness, result in restricted growth and further exacerbation of existing malnutrition.

Considering the immediate and long-term effects of diarrhoeal disease, the two major objectives in treating diarrhoea would appear to be :

1. Early replacement of water and electrolyte losses to prevent or treat dehydration.
2. Maintenance of adequate nutrition.

Fluid and Electrolytes Not the Drugs

Till the early seventies, the treatment of diarrhoea consisted of drug therapy, along with the use of intravenous fluids to correct dehydration. Now it has been amply documented that antibiotics are not useful in most cases of diarrhoea, except those caused by vibrio cholerae and shigella and no other chemotherapeutic agents have been shown to be useful in treatment of diarrhoeal illness. Now it is clear that the primary goal of treatment of diarrhoea is fluid and electrolyte replacement. Intravenous therapy has the obvious disadvantage of being expensive, and requiring trained personnel for its administration. The use of this form of fluid replacement would naturally have to be restricted to severe cases of dehydration.

Oral therapy is based on the observation that glucose is actively absorbed by the normal small bowel and that sodium

is carried with it in an equimolar ratio. Thus, in the normal intestine there is considerably greater net absorption of an isotonic salt solution with glucose than of one without glucose. During acute diarrhoea, the absorption of sodium is impaired and administration of salt solution may enhance diarrhoea. However, glucose absorption remains unimpaired and addition of glucose to isotonic salt solution would facilitate the absorption of electrolytes.

The composition of oral fluid which has been widely and effectively used and which is recommended by WHO is as follows :

Sodium	90	mEq/lit
Potassium	20	,, ,,
Chloride	80	,, ,,
Bicarbonate	30	,, ,,
Glucose	111	mM/lit

This is prepared by adding to one litre of water :

Sodium chloride	3. 5 g
Sodium bicarbonate	2. 5 g
Potassium chloride	1. 5 g
Glucose	20 g

Simplification into a home remedy

Such a mixture is available commercially. It can be easily prepared in health centres and dispensed in plastic bags, stored in a dry condition. As an alternative, at the home level the mothers can be taught to prepare the solution by adding $\frac{1}{2}$ teaspoon or 3 to 4 "three finger pinches" of salt and 5 teaspoons or a "four finger scoop" of sugar to one liter of water. Once prepared, the solution should be used up within a day. The solution may be used as the sole therapy to rehydrate patients with mild or moderate dehydration (who constitute a majority) and also for maintaining hydration after rehydration has been achieved. The patient is encouraged to drink as much fluid as possible, thirst being a guide to the amount of fluid required. Vomiting may occur, but can be overcome by administering small amounts, frequently.

A number of studies in children and adults with cholera

and non-cholera diarrhoea have established the efficacy of oral therapy in a hospital environment. The success of oral therapy can be judged by the considerable reduction in the use of intravenous fluids, thus bringing down the cost of treatment. Fewer studies have been done on the use of oral therapy in an outpatient setting. However, it is obvious that children with mild-moderate dehydration can be rehydrated at a health centre and sent home with instructions to the mother regarding the continued use of oral fluid. The instructions should be clear and include use of accurate measurements of the ingredients, if packets are not available as also the correct measurements of water. The need to use up the solution within 24 hours has to be stressed.

The real usefulness of oral therapy lies in the possibility of using this approach in the home setting with minimum or no medical supervision. Information about the usefulness and safety of this approach used in this setting is scanty. It is clear that this is a tool which can be used by the community health workers, paramedical workers for minimising death from diarrhoea.

There are presently some differences of opinion regarding the optimal content of the oral fluid. While the ideal would be to have an universal diarrhoea fluid, there are some who doubt the advisability of the same. The main controversy centres around the sodium content, which according to some, may be too high for universal use. Since, the availability of glucose is limited in some areas, sucrose has been suggested as an alternate carbohydrate source. There is sufficient evidence to show that sucrose can replace glucose.

Not to Forget Nutrition and Sanitation

A recent study in the Philippines has documented that children with diarrhoea, particularly with recurrent episodes, do better nutritionally when treated with oral fluids and continued food intake during the diarrhoeal episode. The major effect of the oral fluid seems to be the quick reversal of nausea, vomiting and anorexia, so much a part of the diarrhoeal syndrome, thereby improving the food intake. However, this

observation needs to be substantiated further.

It seems obvious that while oral fluid corrects the fluid and electrolyte imbalance, the long term effects of diarrhoea, namely malnutrition, can be prevented only by ensuring proper food intake during and following the diarrhoeal attack. However, most of the mothers and many in the medical profession, believe in starving the patients or giving dilute gruel during diarrhoea. In some parts of the country water is forbidden for infants and young children, especially during diarrhoea, as it is believed to worsen the disease and also cause cold. The wide-spread use of oral hydration would necessarily involve studies regarding such practices and suitable modifications to suit the local beliefs.

Oral hydration can at the best be considered as a tool to reduce mortality from diarrhoea. However, the reduction of the disease incidence can only be brought about other measures such as protected water supply, sanitation measures and health education to improve food and water handling practices and personal hygiene. These measures can only form part of overall socio-economic improvement and spread of education and this can not be treated in isolation.

Oral Therapy for Acute Diarrhœa

SINCE the first controlled clinical trials of oral rehydration therapy (ORT) in 1967,[1] studies in adults, children, and infants have shown the efficacy of ORT in mild to severe acute diarrhoeal disease of various aetiologies.[2-4] (The work of the past fifteen years has been reviewed in two recent papers.[5-6]) In many countries diarrhoea is the major cause of morbidity and mortality in children under five, so the potential health benefits of oral therapy are profound. RAHMAN and co-workers,[7] in Bangladesh, have shown an up to fivefold reduction in diarrhoea case fatality with a home-based ORT programme. In India[8] and Egypt[9] similar ORT programmes have been associated with a halving of diarrhoea-related mortality. Although there may be argument over the magnitude of the gains, a decline in the diarrhoea case fatality rate has been a consistent finding when ORT has been accessible to the community and properly used. Early therapy by mouth arrests and reverses used. Early therapy by mouth arrests and reverses the progression to severe dehydration which might otherwise require intravenous fluid. The World Health Organisation has recognised that oral therapy may be the single most important step in the development of programmes to manage diarrhoeal disease as well as a key to the reduction of infant and child morbidity and mortality.[10-11] Questions, however, remain. What is the best formula ? How should it be packaged ? What health care personnel are most appropriate for the dissemination of ORT ? And what are the real effects of ORT on morbidity and mortality ?

WHO has recommended a single oral rehydration formula

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for the management of deficits in water, base, sodium, and potassium.[10] The formula contains, in mmol per litre, 90 of sodium, 25 of potassium, 80 of chloride, 30 of bicarbonate, and 110 of glucose. Most experts regard this as a physiologically sound mixture that will ensure optimum salt and water absorption for dehydration ranging from imperceptible to severe. To accomplish the final concentration, two variables must be considered—the quantity of salts and the volume of water in which these salts are dissolved.

Stool sodiums are often less than 90 mmol/l, and some workers maintain that the ORT should have a sodium of 60 mmol/l or less.[12] With the exception of rotavirus infections, where there are stool sodium concentrations of 32 ± 3 mmol/l,[13] the higher the stool volume the higher the sodium concentration and the greater the sodium deficit. The existing formula, however, has proved satisfactory in clinical trials in mild to severe diarrhoea when the sodium concentration in stools was between 25 and 125 mmol/l.[14] This preparation has also shown itself safe irrespective of the aetiological agent. Hypernatraemia has very seldom arisen. In fact, lowering the sodium to 60 mmol/l may entail a risk of prolonged hyponatraemia.[15] One reason that the formula has proved successful is that the patient always receives additional sodium-free water.[13-15] Free water may be given on demand or can be given in a two-to-one regimen—that is, two parts of ORT followed by one part of free water in an alternating pattern. Giving water on demand seems as effective and is simpler. Additional sodium-free water must not be directly added to the formula for this lowers the sugar concentration to less effective levels. Feeding the infant with breast milk also reduces the final sodium concentration ; human milk has only 2-3 mmol of sodium per litre. In the treatment of rotavirus diarrhoea, SACK et al.[13] showed that ORT with 90 mmol sodium per litre entailed no risk of hypernatraemia, even though the stool sodium did not exceed 35 mmol/l.

Stool potassium losses tend to be higher in children than in adults and there can be substantial potassium loss during

diarrhoea. The recommended concentration of 25 mmol potassium per litre has been tolerated by all age groups ; children have been treated with solutions containing 35 mmol/l with no adverse effects. Potassium losses may be partly compensated with foods such as citrus fruits, green coconut water, and bananas. Their potassium content is not, however, very high and deficits may be difficult to correct.[16] In severe diarrhoea inclusion of bicarbonate is very important to avoid acidosis.[17]

Intestinal absorption of sodium and water in the diarrhoea patient is enhanced by a facilitated co-transport mechanism. Glucose is absorbed normally in the diarrhoea patient and is the standard against which other sugars or aminoacids must be measured in enhancing this transport. Except in severe diarrhoea sucrose can be substituted for glucose with almost comparable results. However, since only the glucose fraction of sucrose is active in transport, twice as much sucrose must be used. When a packaged mix is prepared at a central production unit, glucose is preferable. Other substrates such as the aminoacid, glycine, have proven very effective in controlled balance studies ;[18] but there have been no large-scale clinical trials. The starches in rice, too, are very effective as substrates in the oral therapy mix.[19]

How the ORT is delivered to the population will depend on the health infrastructure. Where there is a good drug distribution system and containers can be standardised, centralised packaging is recommended.[11] When added to the correct amount of water, a packaged mix gives the most accurate concentrations. But production and distribution of packets may greatly increase the expense of ORT—a serious matter in poor countries. In addition, the distribution of health personnel and supplies may be very uneven. In these situations, a double spoon has been used which measures two ingredients —sucrose and sodium chloride. Measurement with the spoon is less accurate than dispensing from a packet, and potassium and bicarbonate are not included. Despite these drawbacks, community-based programmes employing the spoon have been

COMPLAINT	ASSOCIATED CLINICAL FEATURES		INCUBATION PERIOD	EPIDEMIOLOGICAL FEATURES	ORGANISMS	FIRSTLINE TREATMENT
	COMMON	OTHERS				
ACUTE WATERY DIARRHOEA The stool takes the shape of the container	Vomiting Fever	Severe dehydration in some	24—72 hours	Infants and young children Common world-wide in all socio-economic groups Peak in colder seasons in temperate climates	Rotavirus	Rehydration therapy
	Nausea Vomiting Abdominal pain	Fever Malaise Severe dehydration	6—72 hours	Infants and young children in developing countries Travellers diarrhoea in adults	Enterotoxigenic *Escherichia colic* (ETEC)	Rehydration therapy
	Nausea Vomiting Fever Chills Abdominal pain	Malaise	8—36 hours	Children Common world-wide Food-borne outbreaks (animal products) Warmer seasons	Non-typhoid Salmonellae	Rehydration therapy
	Abdominal pain Fever Malaise	Chills Blood and pus in the stools	3—5 days	World-wide distribution In developed countries may be food-borne (animal products) or transmitted by handling of animals	*Campylobacter*	Rehydration therapy Erythromycin in severe cases
	Vomiting Abdominal pain	Severe dehydration Circulatory collapse, 'shock'	1—3 days	Children in endemic areas Adults in newly affected areas Not found in Latin America	*Vibrio cholerae*	Rehydration therapy Tetracycline
	Nausea Vomiting	Fever	6—72 hours	Nursery outbreaks in developed countries Uncertain in developing countries	Enteropathogenic *Escherichia coli* (EPEC)	Rehydration therapy
DYSENTERY The stool is soft and watery with blood and/or pus	Fever Abdominal pain	Malaise Vomiting Urgency to defaecate Painful spasm on defaecation	36—72 hours	Children Poor hygiene Malnutrition Institutions Warmer seasons	Shigellae	Rehydration therapy Ampicillin or Trimethoprim-Sulphamethoxazole
PROLONGED DIARRHOEA (Or Dysentery) For at least 7 days, stools have been more frequent or of softer consistency (with or without blood or pus)	Abdominal discomfort		2—6 weeks	All age groups World-wide distribution	*Entamoeba* histolytica*	Metronidazole
	Abdominal distension Flatulence	Anorexia Nausea Malabsorption Frothy stools	1—3 weeks	Young children Some travellers Poor hygiene World-wide distribution	*Giardia* lamblia*	Metronidazole

*Can be identified on examination of the stools with a light microscope. Blood and pus from Shigellae and *Campylobacter* can also be identified.

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quite successful in reducing mortality and morbidity. An even simpler method is the pince of salt and scoop of sugar method [20] No utensils are required and, if the mother is individually trained and the training is periodically reinforced, the final electrolyte composition falls within safe limits 98% of the time. In general, the more accurate the ORT mix, the more dependent will be the patient of the health delivery system ; the less complete and standardised the mix, the more accessible will be ORT. There are trade-offs in both directions.

The largest errors in the final electrolyte concentration arise from measurement of the water rather than the salts. What is needed is a standard container, whether in the hospital, the health centre, or the home.[6] Among the suggestions are sale of graduated plastic bottles at a subsidised rate, marketing of the salts in an inexpensive standard container, use of a container of known size such as a beer bottle or glass (such a universal container is usually unavailable), and sending workers from house to house marking a container to show the required volume. There is no substitute for direct interaction between the health worker and the person who actually gives the treatment. Though mass-media campaigns may sensitise the population to the importance of oral therapy, mistakes will be made if health workers and mothers do not receive direct instruction.[21] In Egypt, Bangladesh, and India the effect of ORT on morbidity and mortality was attributed to the intense interactions between health providers and mothers.

In addition to correcting and maintaining salt and water balance, ORT has nutritional benefits in the child.[22-24] Early initiation of oral therapy seems to improve appetite ; and another important element almost certainly, is the push to early feeding. Mothers were encouraged to continue breast-feeding and resume a regular diet as soon as the child wanted to eat. Feeding improves nutrition without increasing the severity or duration of diarrhoea.[25-27] Continued feeding is particularly important when malnutrition is common.

The benefits of ORT, then, are clear. It is effective, inexpensive, easily used, safer than intravenous therapy, and invol-

ves the mother in the child's care. When it is combined with continued feeding, and food intake is increased during recovery, nutritional status gets no worse or improves. Despite these benefits, several countries have shown little enthusiasm for ORT. Paediatricians in Europe and the U.S.A. generally adopt a more traditional approach to diarrhoea—oral replacement of stool loss with low-sodium fluids, limited food intake during diarrhoea, and more reliance on intravenous fluid in the moderately dehydrated child. Though diarrhoea is not the killer in the West that it is in poor countries, it is still a substantial health problem ; more use should be made of the experience gained from ORT therapy. What questions about ORT still need to be tackled ? Other substrates might be added to the oral therapy mix to improve absorption. Better quantitative guidelines should be established for weight restoration and avoidance of milk intolerance. Techniques for training health workers and mothers must be further explored in various cultural settings. And it will be important to evaluate the full impact of national ORT programmes on mortality and morbidity. If there is a tendency to overestimate the impact of ORT on child mortality, this may lead to expectations that cannot be met.

1. Nalin DR, Cash RA, Islam R, Molla M, Philips RA. Oral maintenance therapy for cholera in adults, *Lancet* 1968 ; ii : 370– 73.
2. Pierce NF, Sack RB, Mitra R, Banwell J, Brigham K, Fedson D, Mondal A Replacement of electrolyte and water losses in cholera by an oral glucose-electrolyte solution. *Ann Intern Med* 1969 ; 70 : 1173—81.
3. Mahalanabis D, Wallace CK, Kallen RJ, Mondal A, Pierce NF. Water and electrolyte losses due to cholera in infants and small children : a recovery balance study. *Pediatrics* 1970 : 45 : 374—85.
4. Pizarro D, Posada G, Mata L, Nalin D, Mohs E. Oral rehydration of neonates with dehydrating diarrhoeas. *Lancet* 1979 ; ii : 1209—10.
5. Oral rehydration therapy (ORT) for childhood diarrhea.

Population Reports 1980 ; November-December, series L, no. 2, Population Information Program, Johns Hopkins University.

6. Management of the diarrheal diseases at the community level. Committee on International Nutrition Programs. Washington, D.C. : National Academy of Sciences, National Academy Press 1981.
7. Rahman MM, Aziz KMS. Patwari X, Munshi MH. Diarrhoeal mortality in two Bahgladeshi villages with and without community-based oral rehydration therapy. *Lancet* 1979 ; ii : 809—12.
8. Kielmann AA, McCord C. Home treatment of childhood diarrea in Punjab villages. *Environmental Child Health* 1977 ; 23 : 197—201.
9. Mobarak MB, Hammamy MT, Gomaa AI, Abou-El-Saad S, Lotfi RK, Mazen I, Nagati A, Kielmann AA. Diarrheal Disease Control Study. Final report on phase I to USAID and WHO, April 1981. Strengthening Rural Health Delivery Project, Ministry of Health, Arab Republic of Egypt.
10. A manual for the treatment of acute diarrhoea. World Health Organisation, Programme for Control of Diarrhoeal Diseases, Geneva : WHO/CDD/SER/80.2.
11. Guidelines for the production of oral rehydration salts. World Health Organization. Programme for Control of Diarrhoeal Diseases. Geneva : WHO/CDD/SER/80.3.
12. Bart KJ, Finberg L. Single solution for oral therapy of diarrhoea. *Lancet* 1976 ; I : 633 34.
13. Sack DA, Chowdhury AMAK, Eusof A, Ali MA, Merson MH, Islam S, Black RE. Brown KH. Oral hydration in rotavirus diarrhoea : a double blind comparison of sucrose with glucose electrolyte solution. *Lancet* 1978 ; ii : 280 – 83.
14. Hirschhorn N. The treatment of acute diarrhea in children: an historical and physiological perspective. *Am J Clin Nutr* 1980 ; 33 : 637 – 63.
15. Nalin DR, Harland E, Ramlal A, Swaby D, McDonald J. Gangarosa R, Levine M, Akierman A, Antoine M, Mac-

Kenzie K, Johnson B Comparison of low and high sodium and potassium content in oral rehydration solutions. *J Pediat* 1980 ; 97 : 848--53.

16. Clements ML, Levine MM, Black RE, Hughes TP, Kust J, Tome FC. Potassium supplements for oral diarrhoea regimes. *Lancet* 1980 ; ii : 854.
17. Islam MR, Greenough WB, Rahman MM, Choudhury AMAK, Sack DA. Lobon-gur (common salt and brown) sugar) oral rehydration solution in the diarrhoea of adults. Dacca, Bangladesh, International Centre for Diarrhoeal Disease Research, Pangladesh. April 1980. (Scientific Report no. 36).
18. Nalin DR, Cash RA, Rahman M, Yunus M. Effect of glycine and glusose on sodium and water absorption in patients with cholera. *Gut* 1970 ; 11 : 768—72.
19. Molla M. In : Proceedings of the Workshop on the Interactions of Diarrhea and Malnutrition : Pathophysiology, Epidemiology, and Interventions, Bellagio, Italy, May 11—15, 1981.
20. Cutting WAM, Fllerbrock TV. Homemade oral solutions for diarrhoea. *Lancet* 1981 ; i : 998.
21. Guidelines for the trainers of community health workers on the treatment and prevention of acute diarrhoea. World Health Organisation, Programme for Control of Diarhoeal Diseases, Geneva . WHO/CDD/SER/80.1.
22. Internationtl Study Group. Beneficial effects of oral electrolyte-sugar solutions in the treatment of children's diarrhoea. I. Studies in two ambulatory care clinics. *J Trop Pediatr* 1981 ; 27 : 62—67.
23. International Study Group. Beneficial effects of oral electrolyte-sugar solutions in the treatment of children's diarrhoea. 2. Studies in seven rural villages. *J Trop Pediatr* 1981 ; 27 : 136—39.
24. Rowland MGM, Cole TJ. The effect of early hlucose-electrolyte therapy on diarrhoea and growth in rural Gambian village children. *J Trop Pediatr* 1980 ; 26 : 54—57.
25. Chung AW. The effect of oral feeding at different levels on

the absorption of foodstuffs in infantile diarrhea. *J Pediar* 1948 ; 33 : 1—13.

26. Chung AW, Viscorova B. The effect of early oral feeding versus early oral starvation on the course of infantile diarrhea. *J Pediatr* 1948 ; 33 : 14—22.
27. Molla A, Molla AM. Rahim A, Sarker SA, Mozaffar Z, Rahman M. Intake and absorption of nutrients in children with cholera and rotavirus infection during acute diarrhea and after recovery. Dacca, Bangladesh, International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR, B), 1980.

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The Treatment of Diarrhœa

During the last five years there has been a lot of discussion on the new concept of treating diarrhoea. The W.H.O. produced a nice little booklet on this subject in 1976, a quarterly newsletter, "Diarrhoea dialogue" is being produced by a W.H.O. collaborating centre. In its turn M.F.C. has published an article, "oral rehydration" in the December 1979 issue of its bulletin. We are familiar with the name of O R T, O R S etc. We doctors have even memorised how many mEq of sodium or potassium there are in one litre of W.H.O. recommended oral fluid. So what of all this ? Pharmaceutical companies are still producing rubbishy anti-diarrhoeals ; doctors are prescribing 'Chlorostrep', 'Pectokab', 'Streptomagma', sometimes with 'electral' ; saline drips are immediately put up in a bit more severely dehydrated cases ; 'quacks' are putting up a saline drip for any case of diarrhoea and charging poor villagers Rs. 80 or more.

With this background I want to fit in Somra somewhere—I find it difficult. Somra wants to fit himself in the more remote villages, in the distant village markets on his noisy old bicycle with a tin box and pictures. He explains to the villagers gathered round him, sometimes in tribal language and sometimes in Hindi,—"Take one litre of water, boil it, let it cool, then add the whole content of the packet, stir it and start drinking so long as the diarrhoea continues. In case of vomiting .." Tora can fill in this gap correctly. He knows what to do in case of vomiting Once he brought his son, 12 years old, with severe diarrhoea and frequent vomiting. At first, Tora went to Somra and started giving oral fluid, but the vomiting was a nuisance. In the evening we again prepared another litre of rehydration fluid and started feeding Tora's son with a teaspoon at exactly one minute interval. After five

spoonfuls we stopped for exactly five minutes and started again. Soon Vera had adopted the time intervals and continued in the same manner throughout the night. In the morning the boy walked back home one mile away with his father. Let us return to Somra. He explains—"In case of vomiting, give the fluid slowly with a spoon like in the picture, but never stop fluid in diarrhoea and vomiting."

* * * * *

Somra is a village health worker and it would not be an exaggeration to say he has saved many lives with his rehydration packets. He knows this and so is concerned to make them as widely available as possible in remote village homes and in village shops and markets. His work seems far removed from those places where intellectual discussions take place about O R T, where, for example, the merits of oral rehydration as a "home remedy" are expounded and it is explained that we must not make villagers dependent on packets, we must use local ingredients. "But, Somra objects, in many homes sugar even is not available, do we then use salt and water? In that case it won't be so good, the patient may not improve and we will have to transport him to the centre for a drip to be put up. Perhaps he will be given antibiotics and anti-diarrhoeals too." Somra knows that he can treat even serious cases with his packets and without antibiotics and anti-diarrhoeal preparations. And more importantly, he is promoting a tool with which the villagers can fight against the doctors and quacks who exploit them.

* * * * *

Even now, diarrhoea is a killer in many villages in many parts of India. In the villages, it does not only kill the patient but his/her family too. The exorbitant charge (often between Rs. 200 to Rs. 300) made by the doctor or a quack (not much difference!) for a saline drip and a few injections of 'Vit. B-Comp., 'Baralgan', results in losing land, property, animals.

What causes diarrhoea? There is no doubt that we'll have to find out the cause (aetio-pathology!) before going on to its

treatment. The answer is—insecurity and exploitation in earning, lack of proper housing and drinking water, ignorance with superadded infection of enterovirus, shigella, E. coli and what not.

Now treatment. We speak of anti-diarrhoeal preparations, we say "ban lomotil", at best we try to adopt "scientific and appropriate" oral rehydration therapy. In fact all our discussions are centred around the secondary infection, we forget the primary cause.

I know that I'm going into another discussion. Some may objects that I'm no longer talking about something which is the job of the great medical profession. Some may say that this is now a "political discussion". Some will agree : "intellectual nodding". Again to Somra. I talked to him on this point. Somra knows the primary cause of diarrhoea very well, the question is how to treat it. Let all Somras meet and discuss it. We doctors don't know how to treat diarrhoea.

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