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Oral rehydration: what mothers think

Oral rehydration therapy was shown to be a simple and cheap way of reducing morbidity and mortality caused by diarrhoeal disease in Papua New Guinea. However, good results will be maintained only if the programme of treatment can be made sensitive to the culture of the target population.

In the Southern Highlands Province of Papua New Guinea, where most of the people are engaged in subsistence farming, the treatment of diarrhoea until 1979 involved the administration of sulfadimidine syrup and kaolin mixture by aid post orderlies. Towards the end of that year the authorities introduced a programme of oral rehydration therapy in which the aid posts were mainly responsible for delivery, though mothers were encouraged to give extra fluids at home.

The principal components of the programme were: in-service training for all health workers on oral rehydration for victims of diarrhoeal disease; the provision of oral rehydration solution (Oralyte) sachets and mixing jugs for all treatment units; the withdrawal of sulfadimidine syrup from the aid posts; and a health education campaign using posters and radio to explain the importance of oral rehydration. Environmental improvements such as

clean water supplies were longer-term goals. The present article describes the efficacy of the programme among the Huli people of the Tari district.

For 1977–80 the diarrhoea-specific mortality rate among children under five was 3.3 per 1000 per annum, whereas for 1981–82 it had fallen to 1.3 per 1000 per annum. Since the oral rehydration programme had become fully established by the second period it seems reasonable to conclude that the new measures were responsible for the improvement, particularly as living conditions had not changed appreciably.

In the 12 months up to June 1983 the incidence rate for diarrhoeal disease among children under five was 392 per 1000; the mean duration of an episode was 8.2 days.

In 1978 children had been taken for medical treatment on 52% of the days on which symptoms occurred. In June and July 1983, 62 children with diarrhoea were brought for treatment on 25% of days on which they had symptoms. The reduction in attendance may be partly explained by the fact that kaolin/sulfadimidine was thought by the mothers to produce a more rapid cessation of symptoms than does oral rehydration. It also reflects an increased parental willingness to forgo aid-

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post treatment for this condition. This is likely to diminish the effectiveness of the programme.

Access to aid posts in the Tari district was sufficiently good for an oral rehydration programme based on them to be effective. Nevertheless, home-based therapy was also promoted. Of 68 mothers interviewed during 1983, 50 had given additional fluids at home to children suffering from diarrhoea. A few children were given oral rehydration solution obtained from the aid post, but in most cases the mothers gave additional breast milk or provided sugar cane, soft drinks, soup, or water. This was in sharp contrast to former practice, and demonstrated an awareness of the programme.

Interpreting the Results

In order to explain the findings we must look to the Huli people's understanding of and response to diarrhoeal disease both before and after the introduction of the oral rehydration programme. The anthropological literature gives the impression that most illness in traditional societies is explained in magical terms, but this is not true of the Huli.

Where comparatively complex causes of the illness are suspected they will be combated with an appropriate ritual. Benefits are expected to flow from certain verbal formulae

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expressing the need to dry and block the intestines. Such magic spells to treat diarrhoea are considered by the Huli as the traditional equivalent to the kaolin mixture. However, such measures do not preclude more pragmatic responses. Traditional specific remedies were intended to dry the stool, so dry and firm foods were offered. Fluid intake was restricted, though the child was permitted sugar cane or sips of water to prevent discomfort in the mouth.

During two decades of relatively easy access to modern treatments the Huli largely came to adopt them in preference to their own cures. However, the two may be used in parallel if it is felt that aspects of an illness will not respond to modern methods. In the case of diarrhoea, kaolin mixture and sulfadimidine syrup were seen as more effective equivalents of the traditional pragmatic cures. Home care remained the same, with restriction of fluid intake and the preparation of dry or firm foods. More complex cures, directed at underlying causes of the illness, were also used if the parent felt that they were indicated.

The introduction of the oral rehydration programme ended this situation. Sulfadimidine syrup was withdrawn and kaolin was no longer prescribed. Instead, children were offered large quantities of fluid at the aid post, and mothers were advised to give fluids at home. The Huli suspended their scepticism about the soundness of a new treatment that conflicted totally with the traditional treatment, because they had appreciated the value of the health workers' past recommendations. However, the experience which mothers have had of the new therapy is leading to increasing uncertainty about it. One reason given for this is the reluctance of small children to drink the oral rehydration solution because, the mothers say, its taste is unpleasant. To overcome the imagined problem of unpalatability, mothers are buying bottles of soft drinks with increasing frequency, despite the high cost. Mothers also claim that children are likely to vomit if they do manage to drink a lot of the solution.

A more worrying development is that a growing majority of women are expressing dissatisfaction with oral rehydration therapy, whether this involves the use of solution or plain water. Most women still comply with the regimen, but without conviction. Typical comments include: "I took my child to the aid post for the first two days but the fluid made the diarrhoea worse and we decided to hold a prayer meeting instead". It is no more encouraging to hear positive remarks such as: "I have come straight away for treatment because last time the fluid cleared the diarrhoea up immediately", since they indicate an unduly high expectation of quick results from the therapy and inevitable disappointment.

The health education campaign did not make clear that oral rehydration solution would be slow to take effect. The continuing compliance of Huli mothers, whose first requirement is for the suppression of symptoms, rests mainly on the lack of an alternative medical treatment for a potentially fatal condition. Acceptance is likely to decrease as more women have what they interpret as negative experiences. Of the 68 women interviewed in depth, 43 expressed reservations about oral rehydration. Increasingly, children with diarrhoea are not brought to the aid post unless they have additional symptoms, e.g., fever, for which medical treatment is still seen as efficacious.

The Huli mother is quite capable of recognizing the signs of dehydration. When concerned about a child with diarrhoea she will point out that its eyes are becoming sunken, that its skin is dry, or that the child is wasted. She will be particularly disturbed if the diarrhoea is copious. Many Huli have not embraced the concept of rehydration because of their own views of physiology and pathology. The Huli term for "skin" refers to both the body envelope and the person, and a person's state of health is said to be expressed in the skin. In serious illness an answer is likely to be sought to the question "Why is this person ill?". Prior causes would be considered responsible for both dry skin and diarrhoea. The symptomatic treatment of diarrhoea is regarded as desirable, and traditionally consisted

of dry remedies. But where a child is deemed to be at risk the underlying cause is also considered, and the cure is likely to involve a strengthening ritual, a prayer meeting, or some other healing ceremony.

The Huli are doubtful about the new treatment because they observe that it does not rapidly reduce the flow of diarrhoea. Their view of body fluid makes them unenthusiastic about the relevance of drinking. The presence or absence of vital fluids is seen as an expression of the state of health, not a condition which can be modified by drinking. The soft stools and dry skin of a child dying of diarrhoea are both interpreted as manifestations of an underlying disease process.

None the less, some Huli mothers have come to appreciate the reasons for rehydration therapy. As one woman put it, "the fluid in the skin can be replaced by drinking". Women who accept this link between oral fluid intake and body fluid are more committed than others to oral rehydration therapy for children with diarrhoea.

The health education programme relating to oral rehydration therapy was largely exhortative. If the grounds for oral rehydration were explained within the framework of the Huli view of physiology, the programme would probably be more successful. Otherwise its impact is likely to decline as more mothers become disillusioned. □

A morning's health care—to last a year

The incredible difference in health resources between developing and developed countries is a measure of [Swedish] health care consumption. One example can illustrate this. Togo in West Africa has a little over two million inhabitants. Their total yearly health care budget equals the sum spent on health care within the province of Stockholm from 7 a.m. to 12 noon every day.

— Staffan Bergström: The pathology of poverty—the body language of the third world, *Läkartidningen*, 82: 1069 (1985).

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Improving malaria detection by volunteer workers

One of the oldest and most successful systems for the detection of malaria cases is the volunteer collaborator network in Latin America, which consists of unpaid community workers trained to take blood smears and administer anti-malarial drugs. Evidence from Guatemala indicates that the network can be made more efficient and more suitable for use in other developing countries.

Accurate epidemiologic data are essential for the successful planning and efficient execution of malaria control. Traditionally, national malaria programs have relied on both active and passive case detection to obtain such data. In active case detection, house-to-house visits are made by malaria workers, who take blood smears from patients with fever or other symptoms suggestive of malaria. In passive case detection, blood smears are taken by physicians, nurses, and community volunteers from febrile patients who come to them for treatment. Active case detection provides better coverage geographically, since health authorities can schedule visits by malaria workers to all houses in malarious areas. The major advantages of passive case detection are its lower cost and the fact that the workers responsible live in or near the communities they serve and are thus always available to treat febrile patients.

One of the oldest and most successful passive case detection systems is the volunteer collaborator network of Latin American malaria control programs. It is made up of unpaid community volunteers trained and supervised by malaria control program workers. When a febrile patient visits the home of a volunteer collaborator, the latter takes a thick blood smear and administers a one-dose presumptive treatment for malaria. The smear is sent to the nearest malaria control program laboratory for examination. In most countries a radical or curative treatment is given to all patients with positive smears. The medication may be sent to a volunteer collaborator to administer, or may be administered by a malaria control program worker. There is no charge for either the blood smear or the medication.

Although community volunteers have played an important role in malaria programs in Latin America since the late 1930s, the volunteer collaborator networks as they exist today were first established in 1957, when the emphasis in national malaria services was changing from control to eradication. In the early years of the eradication effort, the principal function of the networks was to detect cases and monitor the disappearance of the disease from each country. The free antimalarial treatment was intended more to attract febrile patients to the volunteer collaborator

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posts so that blood smears could be taken than to reduce the incidence of malaria. Later, as malaria eradication programs began to encounter setbacks and the incidence of malaria rose, the treatment of suspected and confirmed cases of malaria by the volunteer collaborator networks assumed greater importance as a means of reducing malaria morbidity and mortality. In Central America the principal vector, *Anopheles albimanus*, is now resistant to many insecticides, and the treatment provided by volunteer collaborator networks has become the single most effective and economical means of malaria control.

The Volunteer Collaborator Network in Guatemala

Nearly half of the roughly 7 million people in Guatemala live in areas where malaria is transmitted. At present, there are 5400 volunteer collaborator posts in the country. Almost all towns and villages with more than 100 inhabitants have one, and larger communities may have several. Cities usually have fewer relative to their populations; however, physicians and nurses in government hospitals and health centers collaborate with the passive case detection network by taking blood smears from all patients suspected of having malaria and sending them to the nearest malaria control program laboratory. In communities with less than 100 inhabitants, active case detection is carried out on a regular basis by malaria control program workers.

In 1983, the volunteer collaborator network took blood smears and administered antimalarial treatment to a total of 321 573 persons, equivalent to 60 patients per volunteer collaborator. The smears amounted to 72.6% of all those taken for the diagnosis of malaria in Guatemala during the year. Sixteen percent of the smears taken by volunteer collaborators were positive for malaria, but only 9.5% of those taken by physicians and nurses in government health centers and hospitals were positive, even though these workers were able to select the patients from whom samples were obtained. In the active case detection program, the slide positivity rate for smears taken by malaria control program workers was 10.2%.

Volunteer collaborators are selected by an informal poll of the residents of the community, and are trained and supervised by a control program worker known as an evaluator. The only requirements are that the candidate can read and write, is at home most of the time, and is willing to serve without pay. The person who receives the most votes is asked to serve. If he agrees, a mutually convenient time is chosen to begin his training. If the first candidate does not accept, the candidate with the second highest vote is asked to serve.

The training of a volunteer collaborator takes about one and a half days. It includes instruction in filling out patient report forms, making thick blood smears, and administering presumptive and radical antimalarial treatments. The collaborators are instructed that all medication must be administered in their presence and that no antimalarial drug should be given out until a blood smear has been obtained. At the end of the training session, the volunteer collaborator is provided with a malaria kit containing chloroquine tablets, lancets, alcohol, cotton, microscope slides, and a booklet of patient report forms.

After the evaluator has finished training a volunteer collaborator, he visits about 25 houses in the community to advise residents of the existence of the new service and to encourage them to use it whenever they have fever.

The evaluator revisits each post about once every two months, when he checks the malaria

Illiterate volunteers who distribute antimalarial drugs appear to function as reliably as their literate counterparts.

kit, examines the data on the number of patients treated and the number with positive blood smears, counts the chloroquine tablets, and restocks the kit according to requirements. He then visits about 25 families in the community to make sure that the residents are aware of

the location of the post and to remind them to visit it whenever they have fever. If the volunteer collaborator needs retraining, the evaluator will make use of his house-to-house visits to identify febrile patients, who will then be taken to the collaborator's house. Here the evaluator can observe the collaborator making smears, recording patient data, and administering anti-malarial treatment.

A sector chief is responsible for supervising from three to five evaluators. Although many evaluators and sector chiefs have relatively

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little formal education, the majority of them have had many years of experience in the malaria control program, having started as spray operators.

Evaluation

Although the volunteer collaborator networks have been in operation in Latin America for more than 25 years, their effectiveness in malaria case detection and treatment has not been fully evaluated. They comprise one of the longest-functioning primary health care systems in the world and could serve as a model for other primary health care activities. For these reasons, we began detailed studies in 1980 to evaluate the network in eight communities on the Pacific coast of Guatemala.

All of the communities had had a high incidence of malaria during the preceding two years and were regarded by the malaria control program as having well-functioning volunteer collaborator posts. Between 30% and 50% of the families in each community were selected at random and visited on two occasions separated by two weeks. On the first visit, a blood

smear was taken from all available family members, and each was asked if he or she had had chills and/or fever during the preceding two weeks; no antimalarial treatment was administered. On the second occasion, the same people were asked if they had experienced these symptoms since the smear had been taken. Persons with a positive smear were asked what they considered the cause of their illness and where they sought treatment.

Of the 2822 persons interviewed, 205 had positive smears and 52% of these had a history of chills and/or fever during the period from two weeks before until two weeks after obtaining the blood smear. Most patients with positive smears who denied symptoms at this time had been ill during the preceding three months and had treated themselves with a non-curative dose of an antimalarial drug. Of the 106 symptomatic cases with positive smears, only 23.6% had visited a volunteer collaborator. In contrast, 59% had treated themselves with medications purchased at local stores or pharmacies, and 13% had not sought treatment.

Considerable variation was noted from one community to another in the rate of detection of symptomatic malaria. In one village where the volunteer collaborator and the government health post appeared to be functioning very well, 50% of the 24 symptomatic malaria cases were identified by passive case detection. In another community where the two volunteer collaborators were rarely at home, none of the 11 patients with symptomatic malaria detected in the survey had visited them.

The major reasons given for not visiting a post were that the volunteer collaborator was usually absent, the chloroquine tablets caused undesirable side-effects, the finger-prick was unpleasant, and that injections were preferred to oral medication.

Interviews with volunteer collaborators, evaluators, sector chiefs, and community residents revealed several ways in which the functioning of the network might be improved. Because of the large number of posts supervised by each evaluator, two to three months might elapse between visits to a given post. Most people felt that the evaluator's visits

should be not more than four weeks apart, to allow more rapid collection of smears and delivery of results, and to give him more time to resolve any problems that might have arisen. Another difficulty was that at most posts only one person had been trained to take smears; consequently, when the collaborator was not at home, prospective patients generally sought treatment elsewhere. In part, this problem may be attributable to the selection process, which frequently results in the most popular person in the village being chosen as the volunteer collaborator, but does not necessarily choose the family with the largest number of qualified members. Many people also felt that a change was needed in the methods used in the evaluator's house-to-house visits. Because of the large number of families the evaluators were required to visit each day, their talks with residents tended to be repetitive and mechanical. Moreover, little opportunity was provided for the exchange of ideas or for residents to ask questions or voice their opinions.

On the basis of these studies, a project was started in 1982 to test a variety of modifications in the volunteer collaborator network, the objectives being to increase the effectiveness of the network as a malaria case detection and treatment system and to simplify its functioning so as to make it more suitable for use in other developing countries where malaria occurs.

The two major modifications being tested are the distribution of antimalarial drugs by volunteer workers who do not take blood smears, and the use of illiterate persons in this role. Preliminary results suggest that both modifications have been successful. Illiterate

volunteers, using a patient record form consisting of stick-figure drawings, seem to function as reliably as their literate counterparts. Many patients who were apparently afraid of the finger-prick are now visiting those posts where treatment alone is offered.

Several additional modifications of the volunteer collaborator network are being tested. Evaluators in the project area are now visiting the most active and productive volunteer collaborator posts twice as frequently as the less active ones. This has reduced the delay in the collection and examination of blood smears and in the delivery of radical treatments from more than 30 days to approximately 17 days. As a result, there are fewer recurrences of parasitemia and the length of time patients are infective to mosquitos has been reduced. The selection process for new volunteer collaborators has been modified so that only candidates from families with more than one person capable of doing the job are allowed to go forward to the community poll. Finally, the evaluators have been given a more active role in community health education and, during their routine house-to-house visits, are correcting erroneous beliefs about malaria and encouraging the use of established drug treatment schedules for febrile illness. Partly as a result of these changes, volunteer collaborators are now treating 50% more patients per month than they were before the project began.

The results so far obtained indicate that it is possible to increase the efficiency of the volunteer collaborator network and make it more suitable for use in other developing countries. □