INCIDENCE AND MORTALITY DUE TO DYSENTERY AND DIARRHOEA IN TEKNAF - A RURAL BANGLADESH VILLAGE: IMPACT OF A SIMPLE TREATMENT CENTRE

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ABSTRACT

MORTALITY DUE TO DYSENTERY AND DIARRHOEA IN TEKNAF - A RURAL BANGLADESH VILLAGE: IMPACT OF A SIMPLE TREATMENT CENTRE:

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The importance of dysentery and diarrhoea as causes of morbidity and mortality were investigated in 1976 in two nearby villages in Teknaf Dysentery Project area. Shahpuridwip having a population of 9063 and no trearment facilities against dysentery or diarrhoea was kept under surveillance for morbidity and mortality at 7-10 days intervals. Teknaf with a population of 7652 situated 15 miles away was close to the treatment centre established to take care of dysentery and diarrhoea with the help of a male nurse and backed up by a physician available for consultancy. The overall morbidity of dysentery and diarrhoea is Shahpuridwip was found to be 137/1000/year for clinical cases and 12/1000/year of bacteriologically confirmed shigellosis. The mortality there, however, was 2.97/1000/year. In Teknaf, the attack rates of dysentery and diarrhoea were 203/1000/year for clinical cases and 38/1000/year for bacteriologically confirmed shigellosis. The mortality in Teknaf however, was only 0.52/1000/year. The deaths occured almost exclusively in the younger age group. It was found that a significant reduction of mortality could be achieved by relatively simple theraputic measures.

During the last several years treatment of diarrhoea has undergone great simplification. Widespread use of oral rehydration by electrolyte containing fluids has made it possible to treat diarrhoeal dehydration even in remote areas by relatively unskilled paramedical personnel. In 1974 a treatment centre was established at Teknaf, a rural Bangladesh village for the treatment and study of dysentery and diarrhoea. Although the services of a qualified physician was available for consultation, the aim of the project was to use relatively unskilled paramedical personnel for the management of diarrhoea and dysentery. The objective of this report is to evaluate the success of this centre in preventing mortality due to dysentery and diarrhoea.

MATERIALS AND METHODS

Study village: The study village was Teknaf situated near the police station headquarter and is located on the south-east corner of Bangladesh. The nearest urban centre, Cox's Bazar is 60 miles away which is connected with Teknaf by a recently completed motorable road. The population is almost exclusively rural and indigeneous with a small proportion of Buddhist tribals. They had little exposure to any form of urban life. The population served effectively by the treatment centre was the villagers living within 2-3 miles of its location. The size of this population was only a small fraction of the total of 82,000 living within the Teknaf police boundery which is a strip of peninsula, some 20 miles long and 3 miles wide.

Method of treatment: Patients with symptoms of dysentery and/or diarrhoea were treated free of cost if they presented themselves at the centre. The history was recorded in a form and the patients were examined for signs of dehydration. A stool sample was collected for culture and microscopy. If stool sample is unavailable, rectal swabs were obtained from the patients. Streaking was made on to Salmonella-Shigella (S S) and MacConkey's agar. Swabs from patients with watery diarrhoea were additionally streaked on to Monsur's media. After incubation for 20 hours, the plates read and diagnosis made by the standard techniques followed at CRL.

A male nurse with the assistance of a female attendant took care of the routine patients, almost all of whom were outpatients with only a small number requiring hospitalization. A set criterion was developed for the routine treatment of the dysentery and diarrhoea patients. Dehydration was corrected with oral fluid. Requirement of intravenous infusion with the Dacca solution was rarely required. Presence of blood in stool with symptoms of dysentery below 5 years of age called for the use of tetracycline at 20 mg/kg/24 hr. If the symptoms suggested a severe attack of dysentery, or the culture taken yeilded S. dysenteriae type 1 (Shiga's bacillus) ampicillin 100 mg/kg/24 hr was administered for 5 days. Patients given tetracycline was followed up and if a lack of clinical response was found, ampicillin was administered. Patients showing complications were referred to the physician.

Surveillance: All the families residing in the Teknaf village community of Jaliapara, Kulalpara and Burmapara with a total population of 7652 persons were visited by field surveillance assistants once a week to collect morbidity data. This method collected information from those were not attending the treatment centre. They also recorded any birth and death occuring in the family during the preceeding week.

Control village: Shahpuridwip situated 12 miles away acted as the control village. It is connected with Teknaf by a dirt and mud road depending on the season. Boats could also be used between Shahpuridwip and Teknaf to carry people. This village was comparable to the study village of Teknaf in the living style, economic status and occupation. It was also felt that the morbidity pattern of diarrhoeal and other diseases were not much different between the two villages.

No therapy was available to the villagers residing in Shahpuridwip. Although they were free to go to Teknaf centre for treatment, only a few patients did so mainly because of the distance. House to house surveillance for searching out dysentery and diarrhoeal cases were made in Shahpuridwip along with the collection of vital statistics. However the interval between the visits varied between 7-10 days. If a patient was found to have symptoms of dysentery and diarrhoea, rectal swab or stool swab was collected and streaked directly on to S S and MacConkey's agar. These were sent to Teknaf for incubation and identification. For the last 3 months the swabs were not plated in the field but

were put into buffered-glycerine media which were transported to Teknaf for streaking and incubation.

The result of one year of observation between January 1 and December 31, 1976 are presented here.

RESULTS

Attack rates from dysentery and diarrhoea: The attack rates from dysentery and diarrhoea as based on the history and bacteriologically confirmed are shown in the table 1. It was obvious that incidences of both clinical dysentery and shigella positive cases were extremely high in the youngest age group and fell rapidly with the advancing age. The high attack rate in Teknaf was partly due to the presence of the treatment facility close by which was responsible for more than 80% of reported cases. This treatment facility was not available in Shahpuridwip which was a definite factor in underreporting. Shigellosis rate was three times higher in those living in Teknaf as the swabbing there was more prompt and more comprehensive.

Deaths due to dysentery and diarrhoea: Table 2 shows the total number of deaths due to dysentery and diarrhoea as well as from all causes in the villages during the calender year 1976. Total deaths in all age group from all causes was 240, 144 being in Shahpuridwip and 96 in Teknaf, which gave a crude death rate of 16.0 and 12.5 per 1000/year respectively. A total of 35 deaths due to dysentery and diarrhoea occured in these two villages, 25 out of 35 or 71% occured in children below 5 years of age. These deaths constituted 35% of deaths due to all causes in this age group. Age specific deaths rates are also shown in this table.

The number of deaths due to dysentery and diarrhoea fell with the increasing age but tended to go up again in the elderly persons. The peak age for mortality from dysentery and diarrhoea was 1 - 4 years in this population. This is also the age for the peak incidences of malnutrition.

Impact of the treatment centre on mortality: There was a large difference in the mortality rates due to dysentery and diarrhoea between the Shahpuridwip and Teknaf. The former village having no treatment facility but an apprently lower attack rate had a higher mortality compared to the later

village having a higher attack rate but a lower mortality. This difference was statistically highly significant, $p < 0.001$.

Medicines used in the treatment of Dysentery and Diarrhoea: Table 3 shows the list of medicines used for the treatment of dysentery and diarrhoea. A substantial amount of sulphas like sulphaguanidine and sulphadiazine were used, mostly in adult patients with mucoid diarrhoea. Tetracycline was the most frequently used antibiotic againt these diseases. Ampicillin was used less frequently. As mentioned before, only those showing severe dysentery were given ampicillin. Intravenous hydration was used in the centre only for a small number of dysentery patients. A large percentage of diarrhoea patients required intravenous infusion. Oralyte was used for oral hydration in dysentery cases. This apparently high rate of use might have been due to the fact that the dysenteric patient were kept in the treatment centre for sometime to observe them and enable them to pass stool for inspection and examination. Oralyte salt solution were given to them while waiting.

Cost of medicines: The total average cost of medicine supplied was Taka 2/- per patient contact. This does not include the salaries paid to the staff.

CONCLUSION

A simple regimen followed in Teknaf showed that mortality from dysentery and diarrhoea could be significantly reduced by employing trained paramedical personnel even in the face of a high attack rate of shigellosis. The expenses involved was reasonable and within the purchasing ability of the majority of the rural population of Bangladesh.

TABLE 1

AGE SPECIFIC DIARRHOEA/DYSENTERY AND SHIGELLOSIS ATTACK RATE (PER 1000/YEAR) IN SHAHPURIDWIP (SD) AND TEKNAF (TK) TWO RURAL VILLAGES IN BANGLADESH IN 1976

AGE (YR.)	DYSENT./DIARRHOEA		SHIGELLOSIS	
	SD	TK	SD	TK
0 - 4	469	489	40	89
5 - 9	98	222	8	44
10 - 14	45	136	4	29
15 - 19	36	67	2	12
20 - 24	46	100	9	30
25+	74	117	6	19
ALL	137	203	12	38

TABLE 3

PERCENTAGE DISTRIBUTION OF DYSENTERY AND DIARRHOEA PATIENTS ACCORDING TO TYPE OF DRUGS SUPPLIED

Drug	Percent of Patients	
	Dysentery	Diarrhoea
Sulphas	33.2	28.3
Tetracycline	35.7	49.3
Ampicillin	14.8	3.8
Mixture Carminative	9.2	12.1
I. V. fluid	0.9	8.6
"Oralyte" *	12.9	7.6
Other	2.6	5.5
No Medicine	2.5	-

* Oral rehydration salt packets supplied by UNICEF, Dacca

TABLE 2

DEATHS DUE TO DYSENTERY-DIARRHOEA AND FROM ALL CAUSES ACCORDING TO AGE IN SHAHPURIDWIP (SD), POP.=9063 AND TEKNAF (TK), POP.=7652

AGE	DYSENTERY/DIARRHOEA DEATHS			ASDR[C]		% DEATHS	DEATHS FROM ALL CAUSES			%
	SD	TK	TOTAL	SD	TK		SD	TK	TOTAL	
< I MTH	0	I	I	0	3.0	2	33	31	64	27
I - II MTHS	3	2	5	8.0	6.I	I0	23	25	48	20
I - 4 YRS	I5	0	I9	I2.5	0	35	4I	I3	54	23
5 - 9 YRS	2	0	2	I.I	0	I2	I4	3	I7	7
I0 - I4 YRS	0	0	0	0	0	0	I	0	I	4
I5 - I9 YRS	0	I	I	0	I.2	25	2	2	4	2
20 - 49 YRS	5	0	5	7.5	0	22	I3	I0	23	I0
50+	2	0	2	0.7	0	7	I7	I2	29	I2
ALL AGES	27	4	35	2.97	0.52	I5	I44	96	240	I00
CDR/I,000	2.97[A]	0.52[B]	2.09	-	-	-	I6.0	I2.5	I4.4	-

A VS B $P<0.001$

C AGE SPECIFIC DEATH RATE