

Experience with Diarrhea Training and Treatment Unit in Shimla

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Acute diarrheal diseases are one of the leading causes of childhood morbidity and mortality in the developing world and a major contributor to malnutrition. In India too diarrhea has been identified as a major killer and cause of illness(1). Recognizing the effectiveness of oral rehydration therapy(ORT) in reducing diarrhea related morbidity and mortality, a National Programme for Control of Diarrheal Diseases has been launched with establishment of Diarrhea Training and Treatment Units (DTUs) as an intervention to achieve the targets. In their performance, all DTUs in the country have shown a decrease in hospital admissions, use of intravenous fluids, antibiotics, antidiarrheals and mortality due to diarrhea. The present study reports the cost effectiveness and impact of ORT on the morbidity and mortality due to diarrheal disease in our hospital DTU situated in a mountaineous region.

Subjects and Methods

This prospective study was conducted in the DTU of Department of Pediatrics, I.G. Medical College, Shimla from January 1993 to December 1994. All patients presenting with diarrhea in the DTU were in-

cluded in the study. Diarrheal illness included acute watery diarrhea, dysentery and persistent diarrhea. Acute watery diarrhea was defined as recent change in consistency and character with passage of 3 or more watery stools. Diarrhea with visible blood in stool with or without fever and tenesmus was labelled as dysentery and when diarrhea lasted for more than 14 days, it was labelled as persistent.

The patient data like age, sex, rural/urban, duration of illness, frequency, character of stool, fever and vomiting was recorded on the predesigned standard diarrhea case sheet. The history regarding feeding of home available fluids (HAF)/ORS before reporting to DTU was also recorded. General physical and systemic examination was done in all cases. Weight was recorded to the nearest 100 g and nutritional status assessed according to the IAP recommendations. Severity of dehydration was assessed by clinical signs and symptoms. Any associated illness like septicemia, meningitis, bronchopneumonia, *etc.*, if present, was also recorded. Acute watery diarrhea, dysentery and persistent diarrhea without dehydration were treated from outdoor Patient Department as per recommendations[^]). Those with some dehydration were given ORS by mothers under supervision in the assessment and treatment area of DTU and cases who improved were sent home after advice. Children who failed to improve on ORT or ones presenting with severe dehydration or associated illnesses were admitted in the Diarrhea Ward. Investigative workup in hospitalized patients included total blood counts (TBC) and stool examination (routine and culture) in all, whereas renal function tests, electrolytes, blood culture, hanging drop evaluation of the stool, urine routine and culture, X-ray chest and peripheral smear for malarial parasite were performed whenever indicated. Intravenous (IV)

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fluids were given to cases with severe dehydration, ORT failure and those unable to feed orally due to associated illness. Criteria for discharge included either complete improvement or showing consistent improvement in the form of a febrile state, no dehydration, decreased frequency, improved consistency and weight gain in cases of protein energy malnutrition (PEM). Data of 166 children who were admitted in the children ward over 2 years corresponding to pre ORT period (January 1986 to December 1987) was used for comparison to determine the impact of ORT on the management of diarrhea. Chi-square test was used to evaluate the significance of the differences.

Results

During the two years period, a total of 1240 children 1 months to 12 years of age, suffering from one of the three clinically classified diarrheas attended the DTU for treatment. Sixty five per cent were boys and 35% girls, 58% came from rural and 42% from urban areas. More than 80% cases were below 5 years of age with majority (47.6%) being infants. Diarrhea was more prevalent (74.9%) between April to September months of the year. Clinical profile of diarrhea and parameters showing the impact of ORT on its management are depicted in *Tables I & II*. Except for bed occupancy, all the other differences between the

TABLE I-Clinical Profile of Diarrhea Cases.

Clinical Profile	Pre-ORT period Jan. 86-Dec.87		Post-ORT period Jan. 93-Dec. 94.	
	No.	%	No	%
Age(yrs)				
<1	81	48.8	590	47.6
1-5	75	45.2	448	36.1
>5	10	6.0	202	16.3
Type of diarrhea				
Acute Watery	121	80.7	1079	87
Dysentery	32	19.3	129	10.4
Persistent diarrhea	-	-	32	2.6
Use of HAF/ORS before reporting at DTU	-	-	520	41.9
Degree of dehydration				
No	48	28.9	738	59.6
Some	101	60.9	369	29.7
Severe	17	10.2	133	10.7
ORT failure	-	-	58	15.7
High purge rate	-	-	20	34.5
Persistent vomiting	-	-	17	29.3
Inability to drink	-	-	21	36.2
Associated illnesses				
Bronchopneumonia	8	4.8	35	10.5
Anemia	-	-	31	9.3
PEM Grade IV	11	6.6	28	8.4
Others	10	6.0	32	9.6

TABLE II—Impact of ORT on Diarrhea Case Management.

Parameters	Pre-ORT period (n=166)	Post-ORT period (n=1240)	p value
Bed Occupancy (%)	13.2	9.8	0.16
Rate of admission due to dehydration and or associated illnesses (%)	100.0	26.8	<0.001
Treatment with ORS alone (%)	28.9	84.6	<0.001
Average expenditure on rehydration per patient			
With ORS*	-	Rs. 4.49*	NA
IV Fluids	-	Rs. 40.29*	
Use of antimicrobials (%)	66.2	15.3	<0.001
Mortality (%)	9.03	0.6	<0.001

* Cost is calculated on the basis of hospital supply.
NA — Not applicable.

pre and post ORT period were statistically significant. Only 15.3% cases required antimicrobials, the commonest indication being dysentery (65.2%) followed by associated bronchopneumonia (18.2%), Cholera (9.5%) and suspected septicemia (6.8%). The average stay in ward was 5.5 days. Only 2 cases (0.6%) died in the hospital and both of them had acute watery diarrhea associated with Grade IV PEM.

Discussion

Diarrhea continues to be a major cause of morbidity in children especially below five years of age in developing countries(1). In the present study 83.7% cases were under five and diarrhea contributed to 9.8% of the pediatric ward admissions. Prevalence of diarrhea peaked during April to September which has also been observed by others(3,4). The relative frequency of different types of diarrhea is not different from that reported in literature(2). ORT is the keystone of the National Diarrheal Disease Control Programme as it is simple, highly effective, inexpensive and technologically appropriate. It can reduce

the hospital admission rate of dehydrated diarrhea cases(5). In our study, more than half (59.5%) the cases of diarrhea presented without dehydration. Severe dehydration was seen in only 10.7% which is comparable to earlier reports from this center(4) and much lower than other areas(6). This is attributable to high rate of ORT use by 41.9% of cases before reporting to DTU. Bed occupancy related to diarrheal diseases was reduced from pre DTU (13.2%) to (9.8%) post DTU period ($p>0.05$) as was mortality from 9% to 0.6% ($p<0.001$). Various other workers have observed mortality rates varying from 5.9% to 17.1%(3,7).

Financial benefits of rational ORT are on two counts, *i.e.*, reduction in IV fluid therapy and use of antibiotics. With rational ORT we could cut down the use of IV fluids administration from 71.1% to 15.45% and antimicrobial use from 66.2% to 15.3%. The cost of rehydration with ORS was much lower than that with IV fluids (Rs. 4.49 Vs 40.29). It is noteworthy that 84.6% of all diarrheal episodes could be managed with ORT alone, thus effecting savings. These achievements are significant since

there is no decline in the overall incidence of diarrhea in the country and an increase of 36% in the rate of admissions in the pediatric ward during 1993-94 over 1986-87. Secondly, percentage of diarrhea with associated illnesses like PEM, pneumonia, etc. which necessitated admission were more in post DTU period than the pre DTU (17.4% vs 42.6%).

Although the benefits and results of ORT with diarrheal disease management are highly encouraging, still it is observed that ORT is being used only in one third episodes of diarrhoea(8). Hence a lot is needed to be done on health education of mothers and practitioners towards changing the diarrhea management practices.

In conclusion, establishment of DTU has resulted in a favorable impact on the rational management of diarrhea in a cost effective manner.

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