

## Brief Reports

### Management of Diarrhea in a DTU

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Diarrheal disease continues to be one of the major causes of mortality and morbidity in India and in other developing countries. The current recommendations for treatment of diarrhea involve simple principles of standard case management of diarrhea (SCMD) based on clinical diagnosis(1). It comprises ORT usage, continued feeding during and after diarrhea, selective use of intravenous fluids and drugs for management of all types of diarrhea. The reported results from DTUs (Diarrhea Treatment and Training Units) of teaching hospitals which are following SCMD, are very encouraging with regard to the improved case management and decreasing mortality(2,4) and the reduced hospital cost for management(2,4). Diarrheal morbidity and mortality can be considerably reduced if this approach of SCMD is practiced at all levels of health delivery system. The teaching hospitals can play a vital role in the promotion of correct, recommended practices of treatment of diarrhea by creating awareness and confidence in ORT usage among doctors and mothers by setting up their own DTUs. We report our 3 years

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experience in DTU in Vani Vilas Hospital, Bangalore Medical College, Bangalore.

#### Subjects and Methods

Case management practices in the DTU were retrospectively analyzed from January 1992 to December 1994.

#### *Physical Lay Out*

The DTU has three areas, viz., (i) Reception and Triage Area (RTA) situated at the entrance of the main hospital; (ii) Oral Rehydration Therapy area (ORT area) situated next to RTA; and (iii) a Diarrhoeal Ward (DW). One to two post-graduates and 2-3 internees look after the functioning of the DTU from 9 a.m. to 4 p.m. and the Emergency duty doctors take over the function of DTU until next day 9 a.m. The same treatment protocol is followed by both DTU and Emergency duty doctors. Self educative, colorful posters are displayed in these DTU areas.

#### *Flow of Patients and Management Practices*

All patients with diarrhea directly report to the DTU where they are registered and examined by the concerned doctors who decide the treatment plan as per the guidelines on management of diarrhea(5,6). Historical details, hydration status, nutritional status and other relevant clinical examination findings are recorded in a Diarrhea Case Record form especially designed for the purpose. Cases with diarrhea with 'No dehydration' and with no other associated illnesses requiring admission, are sent home with 2 ORS packets with advise to mothers about the method of preparation of ORS, administration of ORS and the quantity to be given. They are also advised to continue to feed the baby and report back if signs of dehydration appear.

Cases with "dehydration" are monitored and managed with ORS and

continued feeding, for over 4-8 h in the ORT area and later sent home with advise to mothers to continue ORS and feeding at home and report back if signs of dehydration appear. Cases with 'No dehydration', but who present with vomiting and excessive purging are also observed in the ORT area for 1-2 h and managed until the mothers gain confidence in ORT and then sent home with advise.

Cases with 'severe dehydration', persistent vomiting and other complications of diarrhea are admitted in the DW (Diarrhea Ward). These patients are rehydrated by using intravenous Ringer's lactate solution initially, followed by ORS as soon as the child is able to drink. The feeding is also continued. The hospital supplies food for feeding. Patients 'with or without dehydration' are admitted if they have other associated illnesses requiring admission. These cases are shifted to the general wards after the diarrhea is controlled.

Antibiotics are not routinely used in the DTU but prescribed only for cases of dysentery, cholera and those with associated respiratory illness, meningitis, *etc.* Cholera cases are, however, shifted to epidemic disease hospital after hydration and initial antibiotic therapy. Antidiarrheals and antiemetics are never used.

At the time of discharge, mothers again receive advise regarding continuing feeding and ORT at home and they are also advised to report back if the signs of dehydration appear.

## Results

A total of 7966 children attended DTU from January 1992 to December 1994 with 4374 males (54.90%) and 3592 females (45.50%). Of these, 6736 cases (77.03%) were less than 2 years of age, 1187 subjects (14.9%) were between 2-5 years

and 643 patients (8.07%) were above 5 years of age. ORT was given to 2412 (30.5%) children before reporting to DTU of which 1187 cases (14.9%) had received ORS and 1225 cases (15.38%) had been given home available fluids (HAF).

The type of diarrhea was acute watery type in 7316 cases (91.84%), dysentery in 451 cases (5.66%) and persistent diarrhea in 199 cases (2.50%). Mortality in each of these types was 59 (0.8%), 6 (1.33%) and 7 (3.51%), respectively. There were 61 cases of cholera and none of them died. The average duration of hospital stay for admitted cases was 3 days and for those managed in the ORT area was 2 hours 45 minutes.

*Table I* shows the distribution of cases as per their hydration status and type of fluid used for management. In 6957 cases (87.33%) the type of fluid used was only ORS. Out of 1009 cases (12.67%) who needed intravenous fluids, 254 (3.19%) had "dehydration", in whom oral rehydration was not possible because of high purge rate in 111 (1.40%), persistent vomiting in 87 (1.09%), inability to drink due to oral thrush or prior sedation in 36 (0.45%), and due to other reasons like distension of abdomen, or social problems in 20 patients.

The overall case fatality observed was 0.9%. Out of 72 cases who expired, 43 (59.72%) had associated severe malnutrition with pneumonia and anemia, 14 (19.44%) had CNS infection, 13 (18.10%) had septicemia and in 2 cases (2.77%) deaths could be directly ascribed to diarrheal disease. Out of these two deaths, one was due to shigella encephalopathy with severe dehydration, and the other was due to severe dehydration with acidosis. These patients died within 5 and 12 hours of admission, respectively.

Our experience also highlights the

**TABLE I**—Distribution of Cases as per Hydration Status and Type of Fluid Used for Management.

Hydration status	Sent home on advise (ORT)	Managed in ORT Corner (ORS)	Admitted in DW	
			ORS	IV Fluids+ORS
No dehydration (n = 4913)	4253		* 660	
Dehydration (n = 2298)	—	1374	* 670	** 254
Severe dehydration (n = 755)	—	—	—	755
Total	4253	1374	* 1330	1009

Only ORS Used = 6957 (87.33%) and IV + ORS = 1009 (12.67%)

\* Admitted for associated problems.

\*\* Unsuccessful ORT cases.

financial advantages of the unit apart from improvement in case management of diarrhea. The expenditure incurred on management per patient is shown in *Table II*. All the 7966 cases (100%) received ORS and 1009 cases (12.67%) received, in addition, intravenous fluid therapy initially for rehydration followed by ORS. The average cost of treatment per patient when only ORS was used was Rs. 2.91/- and the average cost of rehydration for one patient by intravenous fluid was ten times more, which was Rs 24.28/-. The average cost of antibiotic therapy incurred per patient for diarrheal disease is Rs 10.84/-.

### Discussion

The current approach of SCMD in children in a DTU set up has many advantages over the treatment practices of the past years. The diarrheal patients bypass busy OPDs to attend DTU where the doctors screen them and decide treatment plan for diarrhea and associated illness if any.

DTU provides the space and opportunity for mothers to directly interact with doctors and receive advise regarding

personal hygiene, preparation and administration of ORS and continued feeding during diarrhea. Patients are closely monitored and evaluated constantly here. Our doctors have developed communicative skills, faith and skills in SCMD. This has ensured avoidance of unnecessary use of antibiotics in all cases, limited use of intravenous fluids and virtual non-usage of antidiarrheals. Our study shows that only cholera and dysentery cases received antibiotics (6.2%). Majority of 'dehydration cases' (88.9%) also received ORT and none of the cases received antidiarrheals. This strategy has apparently brought down the unnecessary high hospital expenditure on admission, intravenous fluids and drugs.

The mortality rates due to diarrheal disease as reported by various workers before the launching of ORT programme varied from 6.5 to 26.5%(7-11). The overall case fatality of 0.9% in this study is consistent with that reported by authors from other DTUs(1,3).

The fact that only 2412 (30.28%) had received ORS/HAF before reporting to our DTU shows that the ORT usage is still not

TABLE II—Expenditure Incurred for Management.

	Number (%)	Average cost per patient in rupees
I. Expenditure for Rehydration:-		
No. of patients given ORS	7996 (100)	2.91
No. of ORS packets used (in litre packets)	23209	
Patients given IV Fluids	1009 (12.67)	24.28
Intravenous fluids consumed (No. of bottles of 540 ml)	1691	
II. Expenditure incurred for antibiotics		
A. Patients given antibiotics		
(a) For diarrhea (cholera & dysentery only)	512 (6.42)	10.84
(b) For associated illnesses (acute respiratory infections, CNS infection, malnutrition etc.)	586 (7.36)	45.50 to 81.50

Average cost is calculated as per the subsidized cost of IV fluids, drip sets, scalp vein sets, ORS packets and drugs supplied to the hospital.

popular enough and needs to be promoted by setting up of more number of DTUs in large hospitals which can impart practical training to different sections of health personnel dealing with childhood diarrheas. The DTU in our hospital is set up in the existing infrastructure. Space and personnel are not truly the major constraints for setting up a DTU; what is clearly needed is the motivation to do so.

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## NOTES AND NEWS

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### VII ANNUAL CONFERENCE OF INDIAN ACADEMY OF PEDIATRICS, HARYANA CHAPTER

This conference is being held on 15th December 1996 at Bal Bhawan, Ambala City. For further information, please contact Dr. H.S. Sabharwal, Organizing Secretary, Sabharwal Children's Hospital, Police Lines Crossing, Ambala City 134 002. Phones: 441446, 441448, 441450, 442223.

### PEDIATRICS IN THE COMMUNITY-2000

This international event is to be held from July 6-10, 1997 at Jerusalem, Israel. For further information please contact: Secretariat: ISAS International Seminars, P.O. Box 34001, Jerusalem 91340, Israel, Tel: 972-2-6520574; Fax: 972-2-6520558; e-mail: [isas@netvision.net.il](mailto:isas@netvision.net.il).