



Perception and Practices of Home Management of Acute Watery Diarrhoea and Its Impact on Dehydration

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Authors' contributions

This work was carried out in collaboration among all authors. Author MZU designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors KF, RSB and MM managed the analyses of the study. Authors TS, MMH, ARMSHK managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Background: Diarrhoea is one of the commonest causes of death in children in developing countries. Proper home management can reduce morbidity and mortality. High rates of dietary restriction, poor knowledge of preparation of ORS solutions and low attention given to clinical indicators are causes for seeking hospital management. This study was done to observe the knowledge of caregivers regarding home management of acute watery diarrhoea and to assess the impact of home management on severity of dehydration.

Methods: This study was a prospective study carried out on children with acute diarrhea who attended outpatient department (OPD) of Rangpur Medical College Hospital and duration of the

study was 6 months. A total of 100 cases were included in this study who fulfilled the definition of acute diarrhea by WHO. The investigator questioned each mother with the help of a preformed questionnaire.

Results: In 85% of cases, caregivers perception about diarrhea was an increase in the frequency and fluidity of stool. About 95% of cases were initially treated at home; treatment was given at home with ORS (95%). There was change in feeding pattern and modified food was given (24%). Perception about ORS preparation was appropriate in 64% and inappropriate in 31% of cases. Inadequate amount of ORS was given in 74% cases. There was no interruption of breast feeding; dietary restriction during diarrhoea was observed only in 2% cases. Most of the parents did not know when to return immediately to hospital. Dehydration status of diarrhoeal cases was no dehydration (81%), some dehydration (18%) and severe dehydration (1%). In majority of the cases different drugs were used.

Conclusion: Most of the caregivers' decided to treat diarrhoea at home. Many of them had wrong perception about preparation of ORS and some of them did not know how to make ORS solution. Inadequate amount of ORS was given in most of the cases. Thus to lessen hospital burden and to prevent dehydration increased emphasis should be given to health education of home management of diarrhea.

Keywords: Diarrhoea; ORS; home management; breast feeding; dehydration.

1. INTRODUCTION

Diarrhoea is one of the commonest causes of death in children in developing countries [1]. Despite the fact that the Control of Diarrhoeal Disease program (CDD) of the World Health Organization (WHO) was launched in 1980 with the aim of promoting oral rehydration treatment (ORT), 3-4 million children are still dying of diarrhea every year [2]. The majority of deaths occur in Africa, South-East Asia and Latin America. 80% of these deaths occur in the first 2 years of life [1].

Clinical experience and intervention studies in developing countries have indicated that proper home management can reduce morbidity and mortality due to diarrhea. Factors of particular importance include prevention of dehydration during diarrheal episodes through the use of ORS, support of nutritional status through the continuation of an adequate diet, and the avoidance of harmful practices [3,4]. Since ORT is a simple and inexpensive life-saving means, both government and international bodies have been promoting its household use. Bangladesh Rural Advancement Committee (BRAC) has visited 14 million households to train mothers in the use of ORT. Despite this, the actual ORT use during childhood diarrhoea has only recently risen to about 60% of all episodes [5].

Most cases of diarrhea can be treated at home by the care givers without getting admission into hospital. In at least 95% of episodes of watery diarrhea dehydration can be prevented using only ORS solution [1]. Most diarrheal deaths are

due to ignorance of health care givers about home management of diarrhea [6]. They should know proper use of ORS and administration of correct volume of ORS. Inappropriate antibiotic use is an important cause of morbidity and mortality of diarrheal disease also [7].

For management of childhood diarrhea Sodesmanet M et al have shown in a suburban West African community that only 58% of diarrheal episodes were treated with ORS and the amount given was insufficient [2]. Mothers with no knowledge of ORS did not use it during the observed attack of diarrhea. McLennan JD et al have shown some harmful practices for home management of childhood diarrhea in Dominical Republic such as high rates of dietary restrictions during diarrhea, positive view of use of antibiotics, poor knowledge of preparation of salt-sugar solutions and low attention given to clinical indicators as reasons for seeking professional treatment [3]. Ali M et al have shown for management of childhood diarrhea in rural Bangladesh that overall ORT use rate was 29%, only 17% of the cases use it adequately [4]. Common reasons for not using ORS included misperception about diarrhea, incorrect assessment and difficulties with administration of oral rehydration solutions.

Omokhodion FO et al. have shown in case of diarrhea management by Nigerian market women that 33% of the mothers gave ORT at home and 19% purchased drugs at a chemist [8]. Bandyopadhyay S et al. have shown that only 10.8% of mothers in Delhi, India prepared the ORS correctly [9]. Widarsaet KT et al. Have

shown that only 37% of mothers in West Lombok, Indonesia were able to prepare ORS properly [10]. Perez-Cuevas R et al have shown in Mexico that household treatments consisted of symptomatic drugs (35.2%) and changes in feeding patterns (36.2%), which is suppressing milk and dietary products and interrupting breast feeding (12.2%) [10]. While Akepede GO et al have shown in North eastern Nigeria that some traditional healers strongly believed that breast feeding was an important cause of diarrhea and that, in some cases, diarrhea was only amenable to traditional treatment [11]. Meanwhile, Okoro BA et al have shown in rural communities of Nigeria that drug use rate was 75.6% for home management in diarrhea. Antibiotics (40.3%) antiprotozoals (24.6%) and anti-diarrhoeals (15.3%) were the main groups of drugs used [12].

In their study Nkwi PN have shown that in Cameroon mothers suspect social and spiritual causes for diarrhea and oral rehydration therapy (ORT) is ignored by most mothers [6]. Routanen T et al have shown home management practices in Finland that ORS were given in 37% cases [13]. However, when given, ORS was diluted with other fluid in 4% of cases. 7% of children were kept fasting for at least one day. Taha AZ et al have shown that, in rural Bangladesh 63% mothers received information regarding ORS and 64% mothers knew how to prepare ORS correctly. The ORS use rate was 74% and mothers' skill of use of ORS was significantly associated with having seen a packet of ORS and mothers' education [14].

Home-based ORT appears to be lifesaving when it is vigorously prompted and mothers are repeatedly educated in its preparation and use. In Bangladesh, a large number of hospital indoor beds in pediatric unit are occupied by the patients of acute watery diarrhea. Many patients which could be managed at home are admitted into the hospital. It creates a burden to the hospitals, also economic burden for a country like Bangladesh. So this study is planned to see the knowledge of health care givers and to see the pattern of practices of home management. If it is evaluated by the proposed study that home management of acute watery diarrhea is not well known to health care givers then we should emphasize on making policy regarding health education of health care givers and community-based practitioners who are directly related to home management of acute watery diarrhea.

2. SUBJECT AND METHODS

This study is a prospective and descriptive analysis of acute diarrhea cases aged < 5 years who attended outpatient department (OPD) of Rangpur Medical College Hospital, Bangladesh and the duration of the study was six months, April 2016 to September 2016. A total of 100 cases were included in this study who fulfilled the definition of acute diarrhea by World Health Organization (i.e the passage of three or more loose or watery stools in a 24 hours period, a loose stool being one that takes the shape of a container).

Prior to the initiation of any rehydration therapy, investigator performed a clinical evaluation, with particular attention to the dehydration and illness, degree of dehydration, purging rate, physical characteristics of stool and nutritional status. Investigator questioned each mother with the help of a preformed questionnaire. The questions focused on socioeconomic and demographic characteristics, medical history, use of oral rehydration therapy at home, breast feeding practices for the child, personal hygiene, use of drinking water and housing conditions.

Each child was weighed undressed using a balance scale and height was measured. After taking the history, a thorough physical examination was done and recorded on the preformed questionnaire. Dehydration was assessed as no dehydration (no clear signs of dehydration), moderate or severe dehydration was diagnosed according to WHO criteria for assessing dehydration, which includes two or more signs (i.e .sunken eyes, absent tears, dry tongue), with at least one key sign (i.e. mental change, thirst and skin pinch). Collected data was analyzed by SPSS 12.0.

3. RESULTS

In 100 cases 24% were aged 5-10 months, 7% were under 5 months and rest were over 10 months. The age range was 2 – 59 months, Mean \pm SD = 20.36 \pm 14.88. Male comprised 55% of the studied subject. (Table 1). Only about one third (35%) parents were literate, the rest were illiterate. Nearly half of the parents had minimal monthly income of less than 3000 taka while only 1% had more than 20000 taka monthly income. Most of the parents used closed latrine and all the parents used tube well water in the studied population (Table 2).

Exclusive breast feeding (EBF) up to 6 months was only practiced by 10% of the studied subjects and 10% children continued only breast feeding after 6 months. About 22% of the infants continued EBF up to 3 months and 40% up to 4 months, 15% up to 5 months. Most of the patients had both increased frequency and fluidity of stool according to the parent's perception (85%). Only 5% parent initially thought about taking the patient to the hospital. (Table 3).

Table 1. Distribution of AWD cases in relation to age and sex (Total number =100)

Demographic criteria	Number (%)
Age in months	
<5	7 (7%)
5 up to 10	24 (24%)
10 up to 15	19 (19%)
15 up to 20	11 (11%)
20 up to 25	8 (8%)
25 up to 30	1 (1%)
30 up to 35	6 (6%)
35 up to 40	9 (9%)
40 up to 45	6 (6%)
45 up to 50	6 (6%)
50 up to 55	2 (2%)
55 up to 60	1 (1%)
Sex	
Male	55 (55%)
Female	45 (45%)
Age range = 2 – 59 months, Mean \pm SD = 20.36 \pm 14.88, Modal age = 18 months	

Regarding treatment more than half of the patients (54%) were treated at home with both ORS and drugs, while 41% were treated with only ORS and 5% patients were not treated at all. (Table 4) The drugs received by the patients were metronidazole (13%), cotrimoxazole (15%), erythromycin (18%), nalidixic acid (3%), zinc (8%) and antiemetics (12%). Regarding perception of ORS intake, about two third had appropriate perception, only 22% took adequate amount of ORS, all the patients continued breast feeding during ORS. Most of the parents had the perception of returning back to hospital when the child got sicker (52%). (Table 5) Regarding dehydration status, only 1 % had severe dehydration, 18% had some dehydration and 81% had no sign of dehydration (Table 6).

4. DISCUSSION

Childhood diarrhoea affecting children under the age of five accounts for approximately 63% of the global burden [15]. It is a leading cause of

mortality in this age group [16]. Appropriate and timely treatment is very important to decrease the burden. Perception of diarrheal diseases is often inadequate in a developing country like Bangladesh. Thus, this study has been done to evaluate the perception and practices of home management of AWD and its impact on dehydration.

According to WHO *diarrhea* is usually defined in epidemiological studies as the passage of three or more loose or watery stools in a 24-hour period, a loose stool being one that takes the shape of a container. However, mothers may use variety of terms to describe *diarrhoea*, depending for example, upon whether the stool is loose, watery bloody or mucoid or there is vomiting. Infants who are exclusively breast-fed, normally pass several soft or semi-liquid stools each day; for them, it is practical to define *diarrhoea* as an increase in stool frequency or liquidity that is considered abnormal by the mother [1]. In this study most of the caregivers' (85%) perception about diarrhoea is increase in the frequency and fluidity of stool (Table 3).

Clinical experience and intervention studies in developing countries have indicated that proper home management can reduce morbidity and mortality due to diarrhoea. Factors of particular importance include prevention of dehydration during diarrhoeal episodes through the use of ORS, support of nutritional status through the continuation of an adequate diet, and the avoidance of harmful practices [3]. Most cases of diarrhea can be treated at home by the health care givers without getting admission into hospital [1]. Most diarrhoea deaths occur due to ignorance of health care givers about home management of diarrhea. They should know the proper use and administration of correct volume of ORS [2]. of ORS. Since ORT is a simple and inexpensive life-saving means, both government and international bodies have been promoting its household use [5].

This study shows 95% of the caregivers' perception is to treat diarrhoea at home. Perception about ORS preparation is appropriate in 64% cases, inappropriate in 31% cases and in 5% cases do not know how to make ORS solution. Bandyopadhyay S et al have shown that only 10.8% of mothers in Delhi, India prepared the ORS correctly [9]. Widarsa KT et al showed that only 37% of mothers in West Lombok, Indonesia were able to prepare ORS properly [10]. Taha AZ et al found that in rural Bangladesh

2002 64% mothers knew how to prepare ORS correctly [14].

This study shows treatment was given at home with ORS in 95% cases. For management of childhood diarrhoea Sodesman M et al have shown in a suburban West African community that only 58% of diarrhoeal episodes were treated with ORS [2]. Ali M et al have shown for management of childhood diarrhoea in rural Bangladesh overall ORT use rate was 29% [5].

This study shows inadequate amount of ORS has been given in 74% cases. Ali M et al documented that in the management of childhood diarrhoea in rural Bangladesh, ORS was used adequately only in 17% cases [5]. Our

study shows in majority (73) of the cases different drugs were used (metronidazole-13%, cotrimoxazole-15%, erythromycin- 18%, nalidixic acid- 3%, anti emetics –12%, zinc- 8%, homeopathic drugs-4%). In this relation, Omokhodion FO et al have found that in case of diarrhea management by Nigerian market women, 19% of the mothers purchased drugs at a chemist [8]. Meanwhile, Perez-Cuevas R et al showed that household treatments consisted of mainly symptomatic drugs (35.2%) [17]. Okoro BA et al also have shown that in rural communities of Nigeria , drug use rate was 75.6% for home management in diarrhoea. Antibiotics (40.3%), antiprotozoals (24.6%) and anti-diarrhoeals (15.3%), were the main groups of drugs used [12].

Table 2. Demographic details of the caregivers (Total number =100)

Demographic details	Number (%)
Education level	
Illiterate	65 (65%)
Literate	35 (35%)
Monthly income (Taka/household)	
<3000	47 (47%)
3000 up to 4000	42 (42%)
4000 up to 5000	7 (7%)
5000 up to 7000	2 (2%)
7000 up to 10000	1 (1%)
10000 up to 20000	0 (0%)
≥20000	1 (1%)
Latrines	
Sanitary latrine	40 (40 %)
Borehole latrine	40 (40%)
Pit latrine	14 (14%)
Open space	6 (6%)
Source of drinking water	
Tube-well	100 (100%)
Well	0 (0%)

Table 3. Caregivers' perception (Total number =100)

Caregivers' perception	Number (%)
Regarding Criteria of stool	
Increase in the frequency of stool	2 (2%)
Increase in the frequency and fluidity of stool	85 (85%)
Fluidity of stool	13 (13%)
Regarding Treatment option	
Take the child to nearer hospital	5 (5%)
Treat the child at home	49 (49%)
Take the child to local quack/ pharmacist/doctor and treat the child at home.	46 (46%)

Table 4. Treatment given at home in AWD cases (Total number =100)

Treatment option	Number (%)
ORS only	41 (41%)
Drugs only	0 (0%)
ORS+ Drugs	54 (54%)
Not treated	5 (5%)

Table 5. Perception about ORS preparation (Total number =100)

Status of perception of caregiver	Number (%)
Perception about ORS	
Don't know	5 (5%)
Appropriate perception	64 (64%)
Inappropriate perception	31 (31%)
Quantity of ORS	
Adequate	21 (22.10%)
Inadequate	74 (77.89%)
Don't know	5 (5%)
Breast feeding	
Continue breast feeding	100 (100%)
Stopped	0 (0%)
Food option	
Usual food should be allowed	66 (66%)
Food should be restricted	2 (2%)
Soft rice should be given	22 (22%)
Breast feeding	10 (10%)
When to return	
Becomes sicker	52 (52%)
Drinks poorly	3 (3%)
Blood in stool	2 (2%)
Fever	0 (0%)
If not improved after 5 days	1 (1%)
If not improved after 3 days	18 (18%)
If not improved after 2 days	20 (20%)
If not improved after 1 day	4 (4%)

Table 6. Dehydration status of AWD cases (Total number =100)

Dehydration status	Number (%)
No dehydration	81 (81%)
Some dehydration	18 (18%)
Severe dehydration	1 (1%)

In this study changes in feeding pattern was also remarkable. Modified food was given in 24% cases. Dietary restriction was in 2% cases. Plain water was given in 29% cases which were not scientifically sound. Perez-Cuevas R et al found similar features where there were changes in feeding patterns (36.2%) consisting in suppressing milk and dietary products and interrupting breast feeding (12.2%) [17].

The results of this study were similar to the results of other several studies performed in our

country and other developing countries. In our country though the ORS use rate increased than before, there are still many obstacles of proper home management including poor knowledge of preparation of ORS, amount of ORS given insufficiently, poor referral knowledge, dietary restriction, changes in feeding pattern and positive view of the use of drugs. Thus, proper intervention should be done at an appropriate level to improve home management. As using ORS solution is the cornerstone of the global effort, initiated by WHO to reduce deaths of young children from diarrhoea, health promotion efforts should target the areas of concern to further improve the home management of through health education [3]. Improved health education should focus more on the quantity of ORS needed, early signs of dehydration and address mothers who have no prior knowledge of ORS [2].

In at least 95% of episodes of watery diarrhoea dehydration can be prevented using only ORS solutions [1]. The study showed no dehydration in 81% cases. This was due to ignorance and less confidence for home management. Some dehydration was found in 18% children and severe dehydration in only in 1% cases.

Health education should be given for clinical indicators as reasons for seeking professional treatment.³ In this study most of the caregivers did not know when to return immediately. In 52% cases they believed when the child becomes sicker, they should return to hospital immediately. In 42% of cases, parents believed that they should return within 1-3 days if not improved. They were not confident about treatment at home. Here, 65% of cases presented with a short history of illness of 1 up to 4 days. The cause for this might be lack of knowledge and confidence regarding home management.

Socioeconomic condition is one of the most important factors having inverse relationship with diarrhoea. In this study 89% of patients came from poor socioeconomic family (within 4000 taka/household). Most of the caregivers were illiterate (65%). In this study, 94 families used latrines, among them 40% family members used sanitary latrine while the rest used open air defecation. Most diarrhoeal episodes occurred during the first 2 years of life. Incidence was highest in the age group 6-11 months, when weaning is started in children [18]. This study offers a unique opportunity to age specific distribution of diarrhoeal cases. 54% of the cases were in between the age of 5-20 months, modal age was 18 months.

It is known that risk of developing severe diarrhoea is many times greater in infants who are not breast-fed than in those who are exclusively breast-fed; the risk of death from diarrhoea is also substantially greater [1]. Our study showed that in 65% cases the duration of exclusive breast feeding was up to 4 months. A related study done in this country showed lower percentage (7.4%) were on EBF [19]. However, in the studied subjects weaning was started in most of the cases between 4-5 months (56%). In this regard, it can be mentioned that, contamination of weaning foods is a major cause of diarrhoeal diseases and malnutrition [20]. Meanwhile, all the studied subject continued breast feeding during diarrhoeal episodes which is a good practice according to WHO guideline [1].

It was appreciable that most of the caregivers' (95%) had the perception to treat diarrhoea at home. But unfortunately, 31% of the caregivers' perception about ORS preparation was still inappropriate and 5% of them did not know how to make ORS solution. It was a major problem for proper home management of diarrhoea. High ORS use rate in this study (95%) might be due to integrated efforts of different sectors, but still inadequate amount of ORS (in 74% cases) had been used for home management of diarrhea in this study. This issue should be addressed for improvement of home management.

In this study, in 73% cases different drugs were used. It indicates positive view of the use of drugs. But indiscriminate use of drugs is harmful for the children. So public awareness should be built-up against indiscriminate use of drugs through proper health education. Eighty one percent of patients attended at ORT corner with no dehydration. The caregivers should be praised that they attended the hospital for seeking medical services. But in this situation the patient could be managed at home. As they were ignorant and less confident for home management they brought their children to hospital. A significant number (18%) of patient attended ORT corner with some dehydration. If proper home management is practiced, dehydration of many of these patients could be prevented.

5. CONCLUSION

This study held in a suburban area of Bangladesh provides important information about perception and practices of home management of diarrhea in children. Most of the caregivers used ORS at home yet they had wrong idea regarding the preparation. However, continuation of breast feeding was observed which is appreciable. Moreover, most of the patients attended the ORT with no dehydration which could be managed at home.

6. RECOMMENDATIONS

Diarrheal disease are still an important cause of mortality and morbidity in developing country like Bangladesh. Thus further large scale prospective study regarding the conception, practice and treatment pattern of diarrhea and dehydration should be conducted.

CONSENT

Informed written consent was obtained from parents of all children before their participation in the study.

ETHICAL APPROVAL

Ethical clearance was taken from the Institutional Ethical Committee to perform the study

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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