



Pre-hospital Management Practices of Acute Gastroenteritis among Caregivers of Children Presenting to a Secondary Health Care Institution

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Abstract

Background: Acute gastroenteritis is the second most important cause of morbidity and mortality worldwide. Effective management of diarrheal illnesses at home is only possible if caregiver is adequately educated and motivated about the use of ORT.

Objectives: To evaluate prescription practices and use of ORT in the management of an acute diarrheal episode in the caregivers of children under 5 years of age

Methods: Caregivers of children under 5 years of age who presented to Civil hospital, Theog and were not taking treatment for same from any other hospital were interviewed on basis of a structured questionnaire.

Results: Caregivers of 112 children who met the inclusion criteria (primarily treated at home with no treatment been taken from any outside hospital or health center) were interviewed. Access to ORT was found in 61% of all children with diarrhea. These being children who were offered ORT at home, had previous experiences with ORS. Socio-economic status did not significantly correlate with better performance.

Conclusion: In our study, we found out that management of diarrhoea (acute gastroenteritis) at home was grossly inadequate. We also found discrepancies in method of preparation and administration of ORT.

Keywords: ORT (oral rehydration therapy) ORS (oral rehydration solution).

Introduction

Diarrhea is the second leading cause of mortality globally among children between 1-59 months of age with estimated 1.8 million childhood deaths each year accounting for about 17% of total childhood deaths⁽¹⁾⁽²⁾. Diarrhea accounts for about 12.5% of deaths in children less than 5 years in India⁽³⁾. Diarrhea also causes substantial morbidity

worldwide; with 2.4 episodes of diarrhea in children each year in children less than 5 years⁽⁴⁾. Without correct and prompt treatment multiple and frequent episodes of diarrhea can lead to various micro and macronutrient deficiencies, stunting and cognitive delay⁽⁵⁾⁽⁶⁾. The importance of oral rehydration therapy is well established⁽⁷⁾ resulting in decrease in mortality due to diarrheal

diseases worldwide, these benefits are even more in developing countries where diarrhea is a major cause of childhood mortality and morbidity⁽⁸⁾. A recent review from developing country suggests that recommended treatment is being received by only 39% of affected children⁽⁹⁾.

The role of appropriate management of diarrhea at home is well established and recognized and even helps caregivers to recognize symptoms and offer home remedies before a doctor can arrive. Home based treatment becomes even more essential and life saving in a resource limited country as ours where there is substantial delay in getting to a doctor. Thus, caregivers need to be demonstrated and taught ability to properly manage diarrhea at home. Oral rehydration therapy (ORT) is provision of oral fluids to replace ongoing fluid losses from body. ORT is divided into 2 phases 1) rehydration phase in which fluid and electrolytes are administered as oral solution to replace fluid lost by diarrhea, 2) and a maintenance phase which includes replacement of ongoing fluid and electrolyte losses plus adequate dietary intake. Recommendations for use of ORT have evolved over years based on advancing knowledge and research. The latest guidelines by WHO recommends the use of reduced osmolality ORS which comes in a standard pack and has to be dissolved in 1 liter of water, beside WHO ORS, other fluids are also promoted either as supplementary or complimentary substitutes depending on local availability. In 2007, ministry of health and family welfare made use of oral zinc with ORS as mandatory and since then zinc and ORS are being available as over the counter medications available in almost all sub-centers and Anganwadis. Despite all recommendations and publications, zinc and ORS are not being widely used in India. In one study, ORS though widely available was not used in 74% of acute diarrhea cases.

Use of antimicrobials in acute diarrhea should be followed strictly as injudicious use of antibiotics can lead to development of antimicrobial resistance and may even distract caregiver from

providing standard care like use of rehydration therapy at home and zinc supplementation⁽¹⁰⁾.

We evaluated the understanding and practices of management of diarrheal diseases at home amongst care providers (parents) in our environment and we believe this would be helpful in ensuring appropriate knowledge among care givers for right management of diarrheal diseases at home.

Method

We interviewed 112 mothers of children under 5 years of age who presented to our hospital with acute gastroenteritis over a period of 1 year. A 15point structured questionnaire was made, and was asked from each caregivers of child who presented with diarrhea. Questionnaire covered essential questions like, duration of diarrhoeal episode, use of ORS at home, reasons against using ORS, perceived cause of diarrhea, method of preparation of ORS and timing of administration, knowledge about common sign and symptoms of dehydration. Caregivers who were admitted with a history of intake of an ORT fluid were asked about type of salt they used and how they prepared the solution, volume of water taken by caregivers were documented and crosschecked by asking them to give examples with common household measurement containers, commonly accepted measures were bisleri mineral water bottle and coca cola bottle of 1 liter. We also enquired about use of antibiotics and other medications used by mothers to stop diarrhea, as most of the caregivers could not remember name of medications that they were using at home. Only those who brought medications which they were using at home were examined by us. Socio-economic class was determined using Kuppaswamy scale. Only children presenting with acute watery diarrhea without other symptoms were include. Children who were being treated at other health care facilities (govt./private) were not included in our study with idea of capturing only those that were managed at home by care givers.

Results

1. Demographic and Socio-economic characteristics

112 caregivers of children under 5 years were included in our study with 44 (39%) were having education higher than secondary school, 34 (30%) of caregivers had been educated upto middle school (8th std.), 21(19%) left studies before primary school and remaining, and remaining 13(11%) (mostly laborers) were uneducated. According Kuppaswamy scale 14(12.5%) belonged to upper middle class, 39(35%) belonged to lower middle class, and remaining 59(53%) were belonging to lower classes. Number of males were 63(56.2%) and females were 59(43.7%) and majority of children were less than 1 year of age (78, 69.6%) and remaining were between 1 and 5 years(34,30.4%)

2. Clinical Presentation

Mean duration of illness before presentation was 2 days \pm 1.5 days, while most frequent duration of illness was 2.5 days. There was no statistically significant difference noted in mean duration of illness before presentation in various socioeconomic classes and duration remained same as 2 \pm 1.5 days.

Eruption of teeth were considered to be main reason behind diarrhea in infants between 6months and 12 months (71, 63%) of caregivers. Distribution of different etiologies perceived by caregivers as a cause of diarrhea is given in following table.

Table 1: Distribution of different etiologies perceived by caregivers as a cause of diarrhea is given in following table.

Perceived etiology of diarrhea	Frequency	Percentage
Teething	71	63%
Infection	28	25%
Food poisoning	9	8%
No idea	4	4%
Total	112	100%

3. Home management of Diarrheas

Amongst 112 caregivers, 68 (61%) started their child on some form of oral rehydration therapy

before they reached hospital. Out of these 68 parents, 52 (76%) had no idea whether ORS helps to restore body fluids and electrolytes; remaining 16(24%) believed that ORT can stop diarrhea. Among the remaining 44 who did not give ORS to their children before reaching hospital, 37(84%) had no experience in starting ORS or use of any other fluid for diarrhea, the remaining 7(15%) gave other reasons like not having time to prepare ORS before hospital visit, non-availability of ORS sachets, not starting ORT as diarrhea is less severe. Distribution of ORS initiation as per the maternal education status is summarized in table below:

Maternal education level	ORS started	ORS not started	Total
Secondary	38	6	44
Middle	26	8	34
Below middle	4	30	34

102(91%) children received WHO ORS, and the rest 10(9%) received some form of home based salt/water solution or soup etc. It was noted during our study that in children being provided WHO ORS solution; majority was prepared by mixing arbitrary amount of ORS from sachet added less than 1 litre of fluid (mostly ½ bottle of coca cola or a single 200 ml glass of water) (79/91 or 87%). Home based rehydration solution being received by 10/112 children was calculated approximately to be less than 500 ml of water in 8 and more than 500 ml in 2 subjects. Overall 79% (89/112) caregivers were giving wrongly constituted ORS mixtures. The method of administration of ORS was also different among caregivers. With 68 mothers who started ORS prior to reaching hospital, 60(88%) used ORS as only fluid irrespective of whether child has passed loose stool or not rest 8 (12%) gave fluids as per recommendations i.e after passage of loose stool and provided other home fluids as well. Maternal education did not confer any advantage on being able to correctly mix ORT as more than 50 % of those with education more than secondary school were also not able to prepare ORT properly.

It was also noted by us that source of information on ORS administration did not have effect on practices being followed by care givers. Source of information included health workers, Anganwadi workers, nurses and other health care workers as 56 of those who received information by any of above were still making ORS wrongly.

Most of the care givers continued feeding their child despite loose stool 106/112(95%) while remaining 6 stopped feeding. Reason for stopping feeding was frequent vomiting (2/6), belief that feeding will aggravate diarrhoea (1/6) and child's refusal to accept feed (3/6). 85/112(76%) children received some form of antibiotics, mostly metronidazole before reaching us. There was a direct relation between dehydration at presentation and number of days of illness before presentation with mean duration of 2.5 ± 1.5 days and 4 ± 2 days in children with moderate and severe dehydration at presentation, however hydration status at presentation did not show any relation to ORT received at home.

Discussion

61 % of care givers were found to be using ORT in their children with diarrhoea before presenting to our hospital. This frequency was less, yet agrees with the trends already stated in literature. According to a WHO report, the data showed increasing trend in many countries⁽¹¹⁾. It was found that benefit of giving ORT in management of acute gastroenteritis has not been fully realised, similar trends were seen in literature from developed countries with various papers from US and Europe showing that these benefits of ORS are seldom realised⁽¹²⁾⁽¹³⁾⁽¹⁴⁾. One probable reason for this might be use of IV fluids therapy and reduced appeal of ORT⁽¹⁵⁾. A worrisome observation was that many caregivers used incorrect amount of water to make ORS at home, many did not know the recommendation for how much volume of water should be used to prepare ORS resulting in children being offered a solution which was either hypotonic or hypertonic which resulted in marked electrolyte disturbances. It has

been widely stated and recognised that hypernatremia due to sodium excess is quite commonly caused due to improperly mixed ORS. Conversely excess of water in ORT in relation to solute is a major cause of diarrhoea⁽¹⁶⁾.

Many of the care givers were found to be using ORT as the sole fluid irrespective of their children passing loose stools or not. Similar finding was also stated by Pierrie-louis et al in their study⁽¹⁷⁾ and also by De Zoyasa et al in their respective studies⁽¹⁸⁾. It was noted that most of the parents were forcefully giving ORT to their children who tend to dislike its taste and might end up in completely rejecting every other form of fluid being offered to them, our this finding was in concordance with Gibbon et al⁽¹⁹⁾. Replacing water loss with inappropriately composed ORT may lead to increased solute load when there is no loss via diarrhoea. Despite well established importance of ORS in acute diarrhoea it is also recommended in various studies that parents/caregivers must have other home-based fluids readily available for use in case child does not like taste of ORS or refuses to take the ORT⁽²¹⁾.

Many of the care givers had previous experiences with using ORT but in our study, there was no significant difference in terms of preparation and administration of ORT from those using it for the first time. The major concern we found out in our study was that there was no statistically significant difference between performance of those caregivers who received the information regarding ORT composition and administration from health workers versus those who did not. This uncovers the basic problem in from of accuracy of information being imparted to them by health workers that exists in our health care system and is a major cause to be worried as most of these patients were in contact with health care system at some point of time during the disease course.

Among 68/112 patient who received ORT at presentation, none was severely dehydrated.

We could not evaluate the electrolyte status in our patients. it is well known in literature that improperly constituted ORS solution can lead to

electrolyte imbalances and may worsen clinical condition of children. Thus we recommend, that a proper and detailed history should always be taken stressing on type of fluids being given to the child, duration of ORT, composition, and sign and symptoms of electrolyte imbalances particularly hyponatremia and hypernatremia. We also noted a general trend towards administration of antibiotics (85/112, 76%) in children of acute diarrhoea presenting to us. These antibiotics were taken over the counter from some local chemist with a general belief in community that diarrhoea is always infectious. We think that such practices should be strongly discouraged as it leads to antimicrobial resistance and also increase financial burden on caregivers with no benefit of treatment course and duration of illness.

Conclusion

In our study, we found out that management of diarrhoea (acute gastroenteritis) at home was grossly inadequate. We also found discrepancies in method of preparation and administration of ORT. This poses a major hurdle and challenge to effective management of a diarrhoeal disease at home. We believe that our finding is not limited to our setup only. We also conclude that health education to caregivers remains the cornerstone for success of home based management of acute diarrhoeal episode.

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