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Perceptions and practices of oral rehydration therapy among caregivers in Cork, Ireland

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ABSTRACT

Background: The use of oral rehydration therapy (ORT) remains limited despite international guidelines for diarrhoeal disease management. This study was done to assess the perception and practice of ORT among caregivers in the management of diarrhoeal disease.

Methods: A descriptive cross-sectional study was conducted in the Paediatric Department of Cork University Hospital, Ireland. The study population consisted of parents/guardians of children attending the Paediatric Day Ward or Paediatric Outpatient Department. A questionnaire consisting of 30 questions was originally designed by the first author to include all the study variables, and was given to the participants.

Results: Out of 402 respondents, 76.6% (n=308) could describe diarrhoea correctly and perceived it as a serious illness. 81.3% (n=327) of participants knew about ORT but only 27.2% (n=89) agreed it was an ideal first line of management of diarrhoeal disease. Diarrhoeal episodes in the preceding 12 months were reported predominantly in children under the age of 5 years (p<0.001). Only 8.7% (n=17) of caregivers used ORT for diarrhoeal management.

Conclusions: Poor uptake of ORT appears to be due to caregivers' negative perceptions of ORT. This emphasizes the need for correct and adequate education.

Keywords: Oral rehydration therapy, Diarrhoea, Acute gastroenteritis

INTRODUCTION

WHO defined diarrhoea as the passage of three or more loose or liquid stools per day (or more frequent passage that is normal for the individual). Worldwide, diarrhoeal diseases are a leading cause of paediatric morbidity and mortality, with 1.5 billion episodes and 1.5-2.5 million deaths estimated to occur annually among children under 5 years. A substantial decrease in mortality is attributable to worldwide campaigns to treat acute diarrhoea with oral rehydration therapy (ORT). In high-income countries, implementation of ORT has not been as successful as in low-income countries. 3.4

Diarrhoeal disease or acute gastroenteritis (AGE) is very common in children and accounts for many emergency department visits and hospitalisations.⁵ Approximately 10% of children under 5 years present to the health care services with AGE each year.⁵ In Europe, the incidence of AGE ranges from 0.5 to 1.9 episodes per person per year with a higher risk for children under 3 years of age.⁶ The most severe threat posed by it is dehydration, and every year, there are at least 230 deaths and over 87,000 hospitalisations of children under 5, reported in the European Union.⁷ Although most children with AGE do not need to be admitted, many are treated as inpatients each year and often remain in hospitals for several days,

thereby exposing other hospitalised children to the illness or themselves contracting other nosocomial infections. Recommendations from the European Society for Gastroenterology Paediatric Hepatology Nutrition/European Society for Infectious Disease (ESPGHAN/ESPID) published in 2008 clearly state that the first line of treatment of AGE should include oral rehydration with standard Oral Rehydration Solution (ORS), the composition of which is specified within same recommendations.^{8,9} NICE emphasizes the use of ORS as the main stay in prevention and treatment of dehydration. Implementation of these guidelines on AGE management in children can lead to reduction in invasive procedures, hospital admissions, and hospitalization periods. 10,11

The morbidity and economic burden associated with AGE appear very significant. Families are the key to achieving the goals set for managing the disease by making the recommendations routine practice in the homes and health facilities.

There was a total of 369 paediatric admissions for AGE in 2016, with 88% being under 5s, in Cork University Hospital, a tertiary hospital in Ireland. There has been no study to ascertain the knowledge and use of ORT in Ireland, although AGE remains one of the major causes for admission in paediatric settings nationwide.

Studies have clearly shown that caregivers' responses and the use of ORT are aligned to their knowledge and attitude towards diarrhoeal disease and the therapeutic option. ^{12,13}

The primary aim of this study was to evaluate the perception and use of ORT in the management of AGE, and secondary to increase the awareness and its use at the community level.

METHODS

Study design and setting

This was a descriptive cross-sectional study, which ran from September to December 2016 in Cork University Hospital, a major tertiary teaching hospital in Cork, Republic of Ireland. Cork is the largest city in County Cork with approximately 126,000 inhabitants, with a density of 3,367 people/km². 14

Study population, and sampling method

The study population consisted of parents/guardians, referred to as caregivers, of children attending the Paediatric Day Ward or Paediatric Outpatient Department in CUH. Only caregivers who voluntarily consented were included in the study. Caregivers whose children were admitted on the paediatric wards or seen in the emergency department were excluded. Using the sample size calculator RaosoftTM (Raosoft Inc., Seattle, WA, USA), 15 at a margin of error of 5%, confidence level of

95%, and a response distribution of 50%, the sample size was projected to be 377. Selection of the respondents did not substantially disrupt the consultation process because the interviews would start long before the start of consultation.

Data collection

A questionnaire consisting of 30 questions was originally designed by the first author to include all the study variables. To assess the feasibility of this study, a pilot study was performed on 15 respondents, but the results were not included for analysis. All respondents provided signed informed consent, prior to completion of the questionnaires. It took an average of 7 minutes to complete each questionnaire. No interpreter was needed.

ORS (dioralyte is the brand in Ireland) use was the dependent variable. Independent variables included socio-demographic data of caregivers (age, sex, residence, religion, employment status, number of children). Data was also collected related to the caregivers' knowledge regarding ORS, diarrhoea, and its clinical features of severity, and to the caregivers' attitude towards the use of ORS in the treatment of diarrhoeal disease.

The accepted definition of diarrhoea was represented by "frequent watery or loose stools".

Statistical analysis

Data were entered and analysed using Microsoft Excel 2010. For descriptive statistics, categorical data were analysed and results presented as proportions, percentages or frequencies. Numerical continuous data were analysed and results presented as means with their standard deviations. Correlations and comparison between groups of categorical data was done and results presented by use of chi-squared test. Statistically significant results were accepted at a p-value of less than 0.05.

Ethical approval

Permission to undertake the study was granted by Clinical Governance Department, Cork University Hospital, Cork. Approval from the Clinical Research Ethics Committee was not needed because of the nature of the study (on site questionnaire administration). All the respondents gave written informed consent. The questionnaires were anonymous; serial numbers were used for identification

RESULTS

Demographic data

A total of 402 caregivers answered the questionnaires. Most them were Irish (n=346) 86% aged between 30 and

39 years (n=135). Mothers filed in the questionnaires in most cases (n=333). 73.1% (n=294) were married, and 21% (n=84) were single parents. The majority (n=290) were employed or self-employed. 68.2% (n=274) had children less than five years old. The summary of the demographic characteristics is given in Table 1.

Table 1: Demographic data, n=402.

Variables	Frequency
	n (%)
Age (years)	n=402
Less than 20	18 (4.5)
20-29	119 (29.5)
30-39	135 (33.6)
40-49	110 (27.4)
50 and above	20 (5.0)
Sex	
Male	69 (17.2)
Female	333 (82.8)
Marital status	
Single	84 (21.0)
Married/ Civil Partnership	294 (73.1)
Separated/ Divorced	17 (4.2)
No response	7 (1.7)
Employment Status	
Employed	266 (66.1)
Unemployed	76 (18.9)
Self-employed	24 (6.0)
Student	22 (5.5)
No response	14 (3.5)
Ethnicity	
Irish	346 (86.0)
European (non-Irish)	38 (9.4)
African	9 (2.2)
Asian	7 (1.7)
South American	2 (0.5)
Maori	1 (0.2)

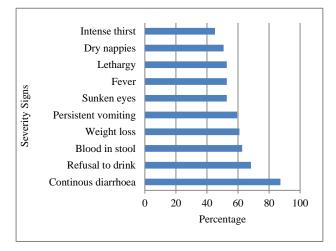


Figure 1: Clinical indicators of severity identified by caregivers.

Table 2: Knowledge of ORT, n=402.

Variables	Frequency n (%)	
Have you heard of ORT?		
Yes	327 (81.3)	
No	75 (18.7)	
Where did you hear about ORT?*		
Media	25	
Pharmacy	169	
Hospital	56	
School	6	
Relatives/ Friends	125	
No response	9	
Function of ORT*		
Treat diarrhoea	28	
Provide energy	37	
Prevent dehydration	300	
Kill infection	4	
No idea	2	

^{*}more than 1 answer possible

Table 3: Perception and use of ORT, n=402.

Variable	Frequency	
	n (%)	
Have you used ORT?*		
Yes	241 (73.7)	
No	86 (26.3)	
Mode of administration*		
Morning/noon/night	72 (22.0)	
When child wants it	18 (5.5)	
Regularly as tolerated	179 (54.8)	
No idea	58 (17.7)	
What to do if vomiting develops? **		
Visit GP immediately	177 (73.4)	
Give Dioralyte slowly	22 (9.1)	
Stop dioralyte and food	32 (13.4)	
No idea	10 (4.1)	
Is Dioralyte enough for diarrhoea?*		
Yes	89 (27.2)	
No	238 (72.8)	
Best way to treat diarrhoea***		
IV fluids	94 (39.5)	
Antibiotics	17 (7.1)	
Anti-diarrhoeal medication	93 (39.1)	
Drinks (7up, juice, Lucozade)	18 (7.6)	
Plain water	10 (4.2)	
Dry food (e.g. toast)	6 (2.5)	

^{*}based on n=327 who had heard about ORT; **based on n=241 who used ORT; ***based on n=238, who responded NO to previous question.

Knowledge of diarrhoea and clinical severity

Among the 402 respondents, 76.6% (n=308) had an accurate understanding of what diarrhoea is. 9% (n=36)

gave incorrect answers, while 14.4% (n=58) could not describe diarrhoea. 70.6% (n=284) respondents perceived diarrhoea as a serious illness. Out of these, 98.6% (n=284) could identify at least one indicator of severity associated with diarrhoea, that would warrant medical attention. The warning signs identified by respondents are represented in Figure 1.

Knowledge and perception of ORT

81.3% (n=327) of caregivers had heard of ORT, mainly from pharmacies (n=169), and relatives/friends (n=125). 91.7% (n=300) of caregivers correctly stated that ORT was used to prevent dehydration. Table 2 shows the caregivers' level of knowledge regarding the role of ORT. Of the 327 caregivers who have heard of ORT, only 89 (27.2%) believed ORT was enough to treat diarrhoea, and 238 (72.8%) did not agree to ORT as the solely therapeutic intervention in the management of diarrhoeal disease in children. The majority, 78.6% (n=187) suggested that intravenous fluids and anti-diarrhoeal medication should be the first line treatment, as shown in Table 3.

ORT practices

73.7% (n=241) of respondents have used ORT. While 73.9% (n=178) considered it helpful, 20.7% (n=50) reported the child would not take it and 5.4% (n=13) concluded it was stressful and time consuming. Out of 241 caregivers that have used ORT, it was noted that 51% (n=123) knew the correct formulation of 1 sachet of Dioralyte in 200 ml of water. 54.8% (n=179) of caregivers correctly suggested that the ORS should be administered to the child as regularly as tolerated, and 17.7% (n=58) had no knowledge on how it should be given (Table 3). 54.1% (n=177) of the caregivers will present to the GP in the event of vomiting during rehydration with ORS at home.

Diarrhoeal experience and interventions

48.8% (n=196) of caregivers reported their children having diarrhoea at least once in the preceding twelve months. Diarrhoeal illness within the previous year was significantly more common in children younger than 5 years (p<0.001). 10.7% (n=21) were hospitalised following GP referral. The general ORT practices were very poor. Only 8.7% (n=17) used ORS as first line intervention at home. Other interventions were further reported in 7.7% (n=15) of caregivers: Lucozade sport (6 cases), Calpol (2 cases), plain water and Imodium in 3 and 4 cases respectively.

DISCUSSION

This study is the first in Ireland to assess the perceptions, knowledge and practices of caregivers regarding oral rehydration therapy (ORT).

As expected, the study sample was mostly represented by women in the age groups 20–49 years. Surprisingly the percentage of respondents who could give the correct description of diarrhoea was only 76.6%, likely accounting for a similar percentage (70.6%) aware of the seriousness of the condition.

The major source of information on ORT was from pharmacies, relatives and friends. It is interesting to reveal such a less number of caregivers receiving information on ORT from GPs or other health care providers. Other studies have shown that it is necessary to strengthen parents' knowledge about diarrhoea and its treatment during hospital consultations and through media. ¹⁶

Almost all respondents who knew about ORT (91.7%) correctly identified its function in preventing dehydration. However, most of the caregivers would rather initiate ORT when diarrhoea becomes continuous than at disease onset. An important finding was that although a high percentage of respondents (81.3%) knew about ORT, only 27.2% considered that ORT is efficient in treating diarrhoeal disease. Caregivers argued strongly that IV fluids and anti-diarrhoeal medication are better first line treatment options. This is like other studies, showing that parents prefer IV rehydration, and treatments that shorten diarrhoea duration. 17,18

The ORT practices found among the caregivers were generally poor. 73.7% caregivers reported to have used oral rehydration solutions (ORS) at some stage. However, out of 196 (48.8%) caregivers reporting diarrhoea in the preceding twelve months, only 8.7% (n=17) used ORS as therapeutic intervention at home. Also, the low percentage (37.6%) of caregivers who knew the correct formulation of Dioralyte shows insufficient knowledge on ORT. These data highlight the need for parental education on initial management of diarrhoea at home.

In this study, caregivers were seen to rely more on their GPs when vomiting develops during ORT 54.1% (n=177) of caregivers will visit the GP as next line of action when a child presents vomiting during ORT. Vomiting is a recognisable barrier to the effective use of ORT, as shown in other studies, mainly because caregivers are unaware of the need to continue ORT after the vomiting has subsided.¹⁹

Although use of ORT does not reduce the incidence of diarrhoea, more than 90% of dehydration from diarrhoea can be prevented with its use, leading WHO to make it the mainstay of diarrhoea management. ²⁰ In recognition of the fact that successful management of diarrhoea lies in the hands of well-informed caregivers rather than the health care system, the way forward is to support and inform caregivers about ORT so that they are more inclined to use it. Studies have shown that too many children are referred to hospitals, and that a significant number of the hospital admissions can be avoided. ²¹ Most

children with diarrhoeal illness can and should be managed in the community, reducing health-care related costs and the risk of nosocomial infections.²²

Strengths and limitations

The major strengths of this study lie in the adequate sample, the 100% response rate and exclusion of caregivers of sick children, minimising perception bias. One limitation is related to the fact that the findings were based on self-reporting; it was however, designed mainly to indicate a pattern of perception and practice.

CONCLUSION

The observed reduced uptake of ORT appears to be a result of caregivers' insufficient information and/or negative perceptions on it.

There is need for educational and other support strategies for patients/caregivers to improve ORT practices. Application of evidence-based recommendations in the management of acute diarrhoeal illness in a local setting may significantly improve the quality of healthcare.

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