

CHILDHOOD DIARRHOEA IN CALABAR: AN 8-YEAR REVIEW

S. O. OCHIGBO, M. U. ANAH, J. J. UDO, J. A. UNIGA AND P. M. OGOR

(Received 21 December 2006; Revision Accepted 8 May 2007)

ABSTRACT

Diarrhoea is a leading cause of morbidity and mortality among children in developing countries. Its prevalence, treatment modality and outcome, are evaluated from time to time in order to create awareness among health workers towards its prevention.

The aim of this study is to document the pattern of childhood diarrhoea in Calabar and to determine any changes in the pattern within an 8-year period.

It was a retrospective study using the records of children seen and admitted to the Diarrhoea Treatment/Training Unit (DTU) of the University of Calabar Teaching Hospital, Calabar, during an 8-year period (1995-2002).

There were 2105 diarrhoea admissions, with M: F ratio 1.4:1. Excluding the months without admissions, an average of 25 admissions were recorded per month. Additionally, an average of 100 children with diarrhoea were treated on outpatient basis. Most (67%) of those admitted reported in the hospital more than 24 hours after onset of illness. Admission frequency was more in dry months (November-April) of the year compared to the rainy seasons (May-October). Seven hundred and fifty one (35.7%) had mild dehydration, 1124 (53.4%) moderate form of dehydration, while 230 (10.9%) were severely dehydrated. *Shigella sp* (43.3%) and *Escherichia coli* (33.3%) were the major bacterial isolates from the stools. The use of salt sugar solution at home was low. Most of the patients (84.8%) were rehydrated with oral rehydration solution (ORS) alone; however, 15.2% received both ORS and intravenous fluids. A fatality rate of 0.8% was recorded during the 8 years.

There was no drop in the high prevalence of diarrhoea in Calabar. Fortunately, there was a decline in the fatality rate probably due to experience gained in its management over the years. There is need to intensify health education on diarrhoea prevention, provision of potable pipe borne water and improved nutrition in the populace as part of child survival strategy.

KEYWORDS: Children, Dehydration, Diarrhoea, Diarrhoea Training/Treatment Unit, Dysentery.

INTRODUCTION

Diarrhoea is a global health problem and a leading cause of illness and deaths among children in developing countries. It is estimated that 3-5 billion episodes of diarrhoea resulting in 4 million deaths occur in developing countries each year with the highest incidence and severity in under-5 years (UNICEF 1996; Huilan et al 1991; WHO 1990). Severe dehydration causes

majority of deaths in children with diarrhoea disease (Antia-Obong 1991). Currently in Nigeria the incidence of acute watery diarrhoea is approximately 4.9 episodes per child per year and there are 200,000 diarrhoea-related deaths yearly in children aged below 5 years (Fed Min Health 1989; Fed Min Health 1992).

Until the advent of oral rehydration therapy (ORT) in 1970, children with diarrhoea were not receiving adequate rehydration at home

S. O. Ochigbo, Department of Paediatrics, University of Calabar Teaching Hospital, Calabar, Nigeria.

M. U. Anah, Department of Paediatrics, University of Calabar Teaching Hospital, Calabar, Nigeria.

J. J. Udo, Department of Paediatrics, University of Calabar Teaching Hospital, Calabar, Nigeria.

J. A. Uniga, Department of Paediatrics, University of Calabar Teaching Hospital, Calabar, Nigeria.

P. M. Ogor, Department of Paediatrics, University of Calabar Teaching Hospital, Calabar, Nigeria.

hence presented in health facilities with severe dehydration requiring intravenous fluid (UNICEF 1996; Guandalini 2002; Gamboa-Salcedo et al 2006; Jousilahti et al 1997). Oral rehydration solution (ORS) is a simple, cheap, acceptable, affordable, accessible and effective means of prevention and correction of dehydration thereby making hospitalization unnecessary in most cases (WHO 1990; Ebrahim 1989; Elliot et al 2004; WHO 2006).

In the University of Calabar teaching hospital (UCTH), children with acute watery diarrhoea are admitted into the diarrhoea training/ treatment unit (DTU), a subunit of the Children Emergency Room (CHER) where they receive ORS and their mothers trained on home management of diarrhoea. In addition, the DTU offers training for medical students, nurses and resident doctors.

It is necessary to audit the unit regularly. Therefore, this retrospective study was undertaken to document the pattern of diarrhoea, its treatment and outcome in the University of Calabar Teaching Hospital (UCTH).

Subjects and Methods

This was a retrospective study of all cases of diarrhoea admitted to DTU of UCTH during an 8-year period (January 1995 to December 2002). There were months with no admissions because of industrial disputes. The DTU is a subunit of CHER. It was established in 1995 with the provision of a 24-hour service. The medical team in the CHER is made up of consultants, senior and junior residents. This team with a minimum of two paediatric-trained nurses per shift covers the DTU.

The admission register in DTU and each patient's case record was examined to extract the following information: name, age, sex, and duration of diarrhoea before admission, type of stool, (plain watery or bloody), and home management of diarrhea before presentation. Other relevant data were nutritional status, and duration of

hospital stay, social class of parents, laboratory results, treatment measures and outcome. The social class of each child was determined according to the method suggested by Olusanya et al (Olusanya et al 1985).

RESULTS

During the period under review, 2,105 children made up of 1,243 males (59%) and 862 females (41%) were admitted into the DTU. The mean admission rate per month during the 8 years (excluding months with no admission) were: 27 in 1995, 23 in 1996, 25 in 1997, 21 in 1998, 19 in 1999, 29 in 2000, 24 in 2001 and 26 in 2002 giving an average of 25 admissions per month. Average admissions frequency during the dry months of November to April was 205 as compared to 123 in the rainy seasons (May-October) (table 1). Admissions were not recorded in the months indicated as "S" which represented periods of industrial actions. Averages of 100 children were also seen per month during the period and were treated on outpatient basis by being offered ORS sachets. Of those admitted, 1988 (94.4%) were aged below 5 years, while 117 (5.6%) were 5 years and above. One thousand four hundred and nineteen (67.4%) of the patients presented after more than 24 hours of onset while 686 (32.6%) reported to the hospital in less than 24 hours of the diarrhoea. Five hundred and eighteen (24.6%) had used some form of self-medication including salt sugar solution (SSS). A total of 751 (35.7%) and 1124 (53.4%) children presented with mild and moderate form of dehydration respectively, while 230 (10.9%) were severely dehydrated (Table 11). Of those with severe dehydration, 45 (2.1%) also had features of protein energy malnutrition as follows: marasmus, 8 (0.4%); marasmic - kwashiorkor, 10 (0.5%); kwashiorkor, 9 (0.43%) and underweight, 18 (0.86%). Majority of the parents were in low social classes.

Table I: No. of monthly admissions for diarrhoea 1995-2002

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	45	42	26	30	24	23	17	24	15	27	13	35	321
1996	44	19	21	38	21	5	S	S	20	26	27	10	231
1997	20	21	30	27	19	22	13	15	34	43	22	35	301
1998	29	29	29	23	19	17	26	15	19	28	14	4	252
1999	S	7	S	5	21	15	15	7	12	28	32	44	186
2000	50	34	28	27	38	22	30	34	20	S	S	7	290
2001	33	54	17	26	S	S	4	20	23	22	17	27	243
2002	43	26	26	36	13	17	S	20	32	13	25	30	281
Total	264	232	177	212	155	121	105	135	175	187	150	192	2105

S = Period of industrial action – no admission

Of the 2,105 patients, 1,784 (84.8%) were rehydrated with ORS alone while 321 (15.2%) received both ORS and intravenous fluids (IVF), 91 of them having progressed to severe dehydration while on admission.

Of the 213 stool results that were retrieved, only 30 were positive for bacterial isolates, which were *Shigella*, 13 (43.3%); *Escherichia coli*, 10 (33.3%); unclassified *Enterobacteriaceae*, 3 (10%), *Salmonella typhi*, 2 (6.7%) and *Staphylococcus aureus*, 2 (6.7%). *Entamoeba histolytica* was isolated in 5 samples.

Of the 2105 patients, 294 (14%) children presented with bloody stools; 1,784 (84.8%) had received antibiotics during their stay in hospital. The patients stayed in the hospital between 1 to 10 days with the mean duration of 5 days; those who had diarrhoea for more than 24 hours prior to admission stayed longer. Seventeen (0.8%) of the children in the series died within the 8 years with 8 of them occurring in 1995; no mortality was recorded in the years 1997 and 2000 (Table II).

Table II: Demographic characteristics of the patients with diarrhoea

Characteristics	Year								Total
	1995	1996	1997	1998	1999	2000	2001	2002	
Total no. Of admissions	321	231	301	252	186	290	243	281	2105
Sex M	179	147	180	157	98	177	140	165	1243
F	142	84	121	95	88	113	103	116	862
No. of admissions 0-5years	301	220	268	234	179	278	239	269	1988

No. of admissions >5yrs.	20	11	33	18	7	12	4	12	117
No. with diarrhoea <24hrs prior to admission	111	79	115	78	59	102	85	57	686
No with diarrhoea >24hrs prior to admission	210	152	186	174	127	188	158	224	1419
No. with bloody stool	53	23	48	31	19	43	35	42	294
No. treated with ORS	255	182	253	212	163	260	202	257	1784
No. treated with ORS + IVF	66	49	48	40	23	30	41	24	321
No. treated with antibiotics	195	128	171	137	100	171	149	125	1176
No with mild dehydration	132	82	130	86	76	88	82	75	751
No with moderate dehydration	152	126	145	149	90	171	115	176	1124
No with severe dehydration	37	23	26	17	20	31	46	30	230
Deaths	8	2	0	2	1	0	3	1	17

DISCUSSION

The present survey has demonstrated that, in Calabar, the under-5 age group are the most vulnerable to diarrhoea, which is at par with global experience (UNICEF 1996; Huilan 1991; WHO 1990; Nte and Oruamabo 2002). In the present series there is a male dominance which tallies with the observation of others (Fed Min Health 1989). This may be explained by the unguarded and adventurous nature of children, particularly the male, in this age bracket whereby they pick and ingest contaminated food items and fruits from the floor. The outcome can be worsened by the lingering high incidence of malnutrition amongst Nigerian children as exemplified in this survey.

This review consecutively shows the same yearly trend in the pattern of diarrhoea cases over the 8-year period. The prevalence tends to be low in the rainy months of the year (May to August) and comparatively high in the dry season. The low prevalence in the wet months is explained by the availability of rainwater, which could easily be boiled and used rather than water from unhygienic sources during the dry months. Most parts of Calabar still lack potable pipe-borne water; people depend on borehole water, which is not

treated and may not be easy to afford. This is probably the situation in most other parts of Nigeria, which are grossly underdeveloped. It is therefore not surprising that diarrhoea continues to contribute to the high under-five morbidity and mortality in Nigeria. Fortunately, this survey demonstrates a sharp decline in the fatality rate from 2.5% in 1995 to 0.35% in 2002. This contrasts with a high case fatality rate of 5.9% recorded earlier in the centre (Antia-Obong 1991). This could be due to intensive treatment, which the unit provided. There is a need to sustain this trend.

Majority of the children (67%) presented in hospital after more than 24 hours of the diarrhoea and the use of salt sugar solution at home was surprisingly low. This depicts ignorance on the part of the parents regarding the danger diarrhoea poses to children. It indicates the need for public health campaign on the dangers of diarrhoea and the use of homemade fluid therapy.

Due to financial constraints, only few patients could afford to do stool culture and sensitivity. Nevertheless, it is not surprising that the bacterial yield was low presumably due to the dominance of rotavirus being the predominant cause of childhood diarrhoea globally (Meropol et al 1997; Cunliffe et al 1998; Chao et al 2006). There were no

facilities for viral studies on the stool specimens. *Shigella* and *E. coli* were the commonest bacterial isolates in our environment which is in consonance with the observation in other centres (Elliot 2004; Nte and Oruamabo 2002).

Bacterial enteric infections have been shown to have a fatal impact on the paediatric population hence the recommendation of antibiotics for confirmed infections (Meropol et al 1997; Cunliffe et al 1998). On mere clinical grounds, the routine use of antibiotics in childhood diarrhoea is contraindicated except in situations whereby the patient appears moribund, malnourished or the stool is bloody. A good number of the children in our series were in these categories and more so when the stool investigation was difficult to conduct due to limited resources hence the generous use of antibiotics.

CONCLUSION

Continuous health education on diarrhoea prevention and other components of the child survival strategies remains a sine qua non. It is the duty of government to provide the community with potable pipe borne water in order to forestall the high incidence of childhood diarrhoea.

ACKNOWLEDGEMENT

We are grateful to Prof. Asindi A. Asindi of the Department of Paediatrics, University of Calabar, for painstakingly reading the manuscript.

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